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Mar 20, 2024

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Department of Defense
OFFICE OF PREPUBLICATION AND SECURITY REVIEW

**APPENDIX A
2024 PENTAGON RESERVATION MASTER PLAN UPDATE**

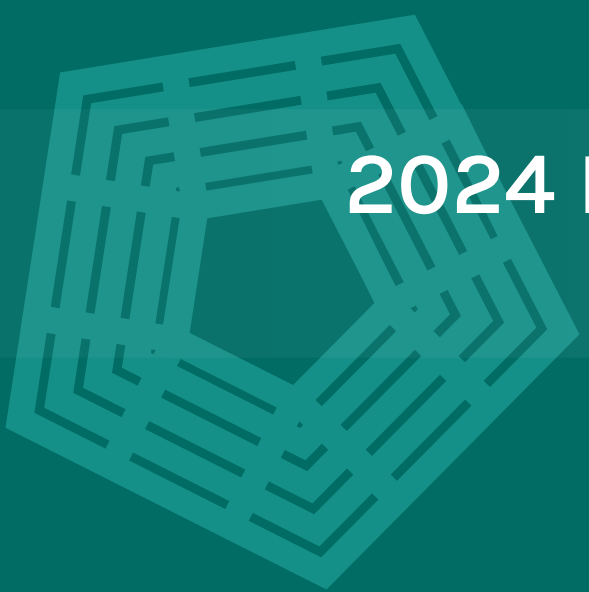
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PENTAGON LAGOON

2024 Pentagon Reservation Master Plan Update

March 1st, 2024



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LIST OF ACRONYMS

ABA	Architectural Barriers Act
ACHP	Advisory Council on Historic Preservation
ACP	access control point
AD	Acquisition Directorate
ADEP	area development execution plan
ADP	area development plan
AHU	air-handling unit
ANC	Arlington National Cemetery
ARFF	Aircraft Rescue and Fire Fighting
ART	aggregate response time
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
AT/FP	antiterrorism/force protection
AVB	anti-vehicle bollard
BAS	building automation system
BES	building envelope standards
BMP	best management practice
BRAC	Base Realignment and Closure
BTL	build-to line
BTWD	bike to work day
C	Celsius
CAPE	cost assessment and program evaluation
CARP	climate adaptation and resilience plan
CAT	category
CCB	Center for Conservation Biology
CCTV	closed-circuit television

CFA	Commission of Fine Arts
CFL	compact fluorescent light/lamp
CO2	carbon dioxide
COR(#)	Corridor (#)
CRAC	computer room air conditioning
CVIF	commercial vehicle inspection facility
D&E	design and engineering
DASH	Driving Alexandria Safely Home
DCFC	direct current fast charging
DDOT	District Department of Transportation
DHRA	Defense Human Resource Activity
DISA	Defense Information Systems Agency
DOAU	dedicated outside air unit
DoD	Department of Defense

LIST OF ACRONYMS

DoDEA	DoD Education Activity
DoDI	Department of Defense Instruction
DoDIG	DoD Inspector General
DRPT	Virginia Department of Rail and Public Transportation
DRSL	DoD Regional Sea Level
DTSA	Defense Technology Security Administration
DVP	Dominion Virginia Power
EA	environmental assessment
EC	electronically commutated
ECM	energy conservation measure
ECM	engineering and construction management
EISA	Energy Independence and Security Act
EO	Executive Order
EPA	Environmental Protection Agency
EPAct	Energy Policy Act (of 2005)
ERCIP	Energy Resilience and Conservation Investment Program
ESB	Environmental and Sustainability Branch
EUI	energy use intensity
EV	electric vehicle
F	Fahrenheit
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FIRM	flood insurance rate map
FOB(#)	Federal Office Building (#)
FONSI	Finding of No Significant Impact
FPCON	force protection condition
FRCS	facility-related control system
FSD	Facilities Services Directorate
FY	fiscal year
GHG	greenhouse gas
HHW	heating hot water
HID	high intensity discharge
HMI	human-machine interface
HOV	high occupancy vehicle
HPS	high pressure sodium
HPSB	high performance sustainable building
HQ2	Amazon Second Corporate Headquarters
HRP	Heating and Refrigeration Plant
HRP	high risk personnel

LIST OF ACRONYMS

HSPO	Homeland Security Presidential Directive
HVAC	heating, ventilating, and air-conditioning
I	Interstate
ICRMP	Integrated Cultural Resources Management Plan
ICRP	Installation Climate Resilience Plan
ID	identification
IDP	Installation Development Plan
IDS	intrusion detection system
IEEE	Institute of Electrical and Electronics Engineering
IEP	Installation Energy Plan
IES	Illuminating Engineering Society
INRMP	Integrated Natural Resources Management Plan
IPS	Installation Planning Standards
ISMP	Integrated Security Master Plan
IT	information technology
LBJ	Lyndon Baines Johnson
LDA	land disturbing activity
LED	light-emitting diode
LEED EBOM	Leadership in Energy and Environmental Design - Existing Buildings: Operation and Maintenance
LEED	Leadership in Energy and Environmental Design
LEP	lighting enhancement project
LF	linear fluorescent
LID	low impact development
M	million
MACC	multiple award construction contract
MACP	Metro Access Control Point
MCTC	Mark Center Transit Center
MEF	metro entrance facility
MH	metal halide
MMBtu	metric million British thermal unit
MOC	modular office complex
MOU	memorandum of understanding
MS4	municipal separate storm sewer system
MW	megawatt
MWh	megawatt-hour(s)
NATO	North Atlantic Treaty Organization
NAVFAC	Naval Facilities Engineering Systems Command
NCPC	National Capital Planning Commission
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act

LIST OF ACRONYMS

NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NPS	National Park Service
NRF	NATO Response Force
NRHP	National Register of Historic Places
OSD	Office of the Secretary of Defense
OUSD	Office of the Undersecretary of Defense
P&R	Personnel and Readiness
PAC	Pentagon Athletic Center
PBMO	Pentagon Building Management Office
PDP	project development plan
PENREN	Pentagon renovation
PERC	Pentagon Emergency Response Center
PFPA	Pentagon Force Protection Agency
PLCC	Pentagon Library and Conference Center
PNT	Pentagon
POV	privately owned vehicle
PRTC	Potomac and Rappahannock Transportation Commission
PSC	permanent split capacitor
PSOC	Pentagon Support Operations Center
PT	physical training
PTC	Pentagon Transit Center
PV	photovoltaic(s)
RDF	remote delivery facility
RIF	remote inspection facility
RMA	resource management area
ROW	right of way
RPA	resource protection area
RRMC	Raven Rock Mountain Complex
SAL	secure access lane
SCADA	supervisory control and data acquisition
SE	southeast
SECDEF	Secretary Of Defense
SES	Street Envelope Standards
SF	square feet
SHPO	State Historic Preservation Office
SMOC	secondary mobile office complex
SOP	standard operating procedure
SOV	single-occupancy vehicle
SRIP	Sustainability Report and Implementation Plan

LIST OF ACRONYMS

SSPP	Strategic Sustainability Performance Plan
SWM	stormwater management
TCP	traditional cultural property
TES	thermal energy storage
TMDL	total maximum daily load
TMP	transportation management plan
UESC	utility energy services contract
UFC	Unified Facilities Criteria
UL	Underwriters Laboratories
UMMC	unspecified minor military construction
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
VA 27	Washington Boulevard
VA	Virginia
VAC	Virginia Administrative Code
VACP	vehicle access control point
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VFD	variable frequency drive
VFR	visual flight rule
VIP	very important person
VRE	Virginia Railway Express
VRRM	Virginia Runoff Reduction Method
VSMA	Virginia Stormwater Management Act
VSMP	Virginia Stormwater Management Program
WFH	work from home
WHS	Washington Headquarters Services
WMATA	Washington Metropolitan Transit Authority
WS	worksheet
WTP	water treatment plant
ZEV	zero emission vehicle

DEFINITIONS:

Per 10 USC 2674 - Operation and control of Pentagon site and defense facilities in National Capital Region:

Mark Center means the larger Mark Center development, which includes the Mark Center Campus (as defined herein), located in Alexandria, Virginia.

Mark Center Campus means that area of land (consisting of approximately 16 acres) containing office buildings, supporting facilities, and improvements thereon, including parking areas, located in Alexandria, Virginia, within the larger Mark Center development, formerly known as the Fort Belvoir Mark Center Campus, and now considered a part of the Pentagon Reservation.

National Capital Region means the geographic area located within the boundaries of (A) the District of Columbia, (B) Montgomery and Prince Georges Counties in the state of Maryland, (C) Arlington, Fairfax, Loudoun, and Prince William Counties and the city of Alexandria in the Commonwealth of Virginia, and (D) all cities and other units of government within the geographic areas of such district, counties, and city.

Pentagon Reservation means the Pentagon, the Mark Center Campus, and the Raven Rock Mountain Complex. *(This definition does not align with the geographical areas encompassed by this 2024 Pentagon Reservation Master Plan Update and previous master plan updates containing "Reservation" in the title.)*

Pentagon means that area of land (consisting of approximately 245 acres) containing the Pentagon office building, its supporting facilities, and improvements thereon, including parking areas, located in Arlington County, Virginia, and considered a part of the Pentagon Reservation.

Raven Rock Mountain Complex means that area of land (consisting of approximately 720 acres) and improvements thereon, including parking areas, at the Raven Rock Mountain Complex and its supporting facilities located in Maryland and Pennsylvania.



EXECUTIVE SUMMARY

Understanding the existing conditions on the Pentagon campus as they have evolved since 2015 serves as a framework for this revision to the 2016 Master Plan Update. The Pentagon master plan area, situated along the Potomac River in Arlington County, Virginia, is approximately 245 acres, consisting of administrative offices, public transit, parking, support, industrial land uses, and green/open space.

The Pentagon building, a National Historic Landmark (NHL), is the most pronounced feature on the campus, covering roughly 35 acres. With approximately 26,560 employees commuting to the Pentagon on a daily basis, as well as a significant number of regional commuters using the Pentagon Transit Center (PTC) and visitors to the Pentagon building and 9/11 Memorial, circulation is an important issue on the Pentagon campus.

The terrorist attack of September 11, 2001, on the Pentagon, as well as the events of January 6, 2021, resulted in changes to the Pentagon campus, including increased security measures, the inclusion of a memorial for those killed in the terrorist attack, the realignment of Route 110 from beneath the River Terrace, and the planned construction of a commercial vehicle inspection facility (CVIF) for the remote delivery facility (RDF). Security at the Pentagon site is in place to protect the Pentagon building, campus functions and facilities, and site employees and visitors.

The master plan area also includes the Mark Center, located in Alexandria, Virginia, at the I-395 and Seminary Road interchange. The Mark Center is approximately 16 acres which mainly consists of office spaces for several Department of Defense (DoD) agencies.



THE MOST RECENT PENTAGON CAMPUS MASTER PLAN WAS COMPLETED IN 2005 AND MOST RECENTLY UPDATED IN 2016. SINCE THAT TIME, A NUMBER OF CHANGES HAVE OCCURRED AT THE CAMPUS.

THIS MASTER PLAN REVISION OF THE 2016 MASTER PLAN UPDATE IS INTENDED TO PROVIDE AN OVERVIEW OF CHANGES SINCE 2016 AND INCORPORATE THE PLANNED PENTAGON CAMPUS PROJECTS. THESE PROJECTS BALANCE VARIOUS PLANNING FACTORS AND REINFORCE A LONG-TERM VISION FOR A PENTAGON CAMPUS WITH AN INTEGRATED NATURAL AND BUILT ENVIRONMENT THAT ENHANCES ENVIRONMENTAL SUSTAINABILITY, SECURITY, AND CLIMATE RESILIENCE. THE LONG-TERM VISION ALSO SEEKS TO IMPROVE SECURITY, ENHANCE THE QUALITY OF LIFE FOR EMPLOYEES, AND ADDRESS ACCOMMODATIONS FOR VISITORS TO THE PENTAGON AND TO THE OTHER PUBLIC FACILITIES LOCATED ON THE PENTAGON CAMPUS GROUNDS.

Security

Improve DoD Headquarters and Pentagon security operations

Safety

Enhance the safety and quality of life of employees and visitors

Sustainability

Enhance environmental sustainability, security, and climate resilience on the Pentagon campus

Balance

Accommodate planning factors and development pressures

Accessibility

Enhance pedestrian, bicycle, and vehicular access

The goal of the Master Plan Revision is to maintain, enhance, and optimize DoD Headquarters/Pentagon operations, to include the following:

- » Improve DoD Headquarters/Pentagon facilities and securities.
- » Enhance the safety and quality of life of employees and visitors.
- » Enhance environmental sustainability, security, and climate resilience on the Pentagon campus.
- » Balance the various planning factors/development pressures on the Pentagon campus, including funding, security, safety, accessibility, public access, historic preservation, being a good neighbor, and sustainability.
- » Enhance pedestrian, bicycle, and vehicular access.

This Master Plan Revision includes specific projects as well as individual component plans for land use, security, circulation, environment and sustainability, and energy. The plan also reflects many of the same features of the 2005 Master Plan but attempts to achieve a more “green” and sustainable campus through the use of surface parking combined with stormwater management techniques versus structured parking with green roofs, which is more expensive and difficult to execute in the present funding environment.

The Master Plan Revision improvements and projects (shown in [Table ES-1](#) through [Table ES-5](#) and [Table 3-1](#) through [Table 3-5](#)) are intended to be implemented over a 20-year time frame. Planned projects are distributed among two phases of development: short-term (0-5 years) and long-term (6-20 years) (see [Table 3-15](#) through [Table 3-19](#)). The majority of projects in this revision are planned to occur within the short-term.



PSOC Kennel



Tree Box Filters



North Village Modifications



Metro Entrance Pedestrian ACP

Highlights of this plan include the following:

- » Continued evolution of the North Village: The completion of the Pentagon Support Operations Center (PSOC) will occur in 2022. Additionally, the current area covered by the modular office complex (MOC) will be converted to green space and outdoor training/activity areas. This area will continue to include the landscape maintenance area.
- » Numerous projects under the Sentry II Program: These efforts will continue to enhance safety and security.
- » Continuation of major changes in the south parking area: These changes will improve the safety, security, and efficiency of the vehicular and pedestrian circulation system, with a focus on creating a strong pedestrian network and improving sustainability features.
- » Continuation of the planned improvements from the 2016 update to the overall pedestrian and bicycle circulation on the Pentagon campus: Connecting the external trails with routes on the campus will provide Pentagon employees a clear and direct route from external trails to employee bicycle racks and pedestrian entrances on the Pentagon campus.
- » An intensified focus on best management practice (BMP) strategies from the 2016 update: These strategies will improve stormwater management practices on the Pentagon campus to reduce the negative impact on waterways within the Chesapeake Bay Watershed and to comply with the Pentagon's municipal separate storm sewer system (MS4) permit through the Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan. Projects from the TMDL Action Plan form a major component of this revision. These projects will enhance sustainability and reduce surface parking.
- » Consideration of new land uses for the surface parking areas south of I-395, along Army-Navy Drive: This will reduce surface parking and provide enhanced use opportunities.
- » A new focus on energy resilience and efficiency: Reflecting the effort contained in the installation energy plan (IEP) for the Pentagon, several projects have been included that will advance energy resilience and efficiency at the Pentagon.
- » Identification of the required steps needed to realize a comprehensive master plan update approximately 5 years after the completion of this revision: This revision includes an overview of the requirements of Unified Facilities Criteria (UFC) 2-100-01, Installation Master Planning, with Change 1, that will need to be met for this future effort.

When realized, the projects and initiatives planned in this document will advance the sustainability, security, accessibility, and quality of life on the Pentagon campus.

Table ES-1 Master Plan Revision Projects: Security and Safety



Table ES-2 Master Plan Revision Projects: New Facility and Land Use Changes

#	New Facility and Land Use Changes	Land Use Change	Shown on Map
1	North Village and PSOC Green/Support Space	Yes	Yes
2	Center Courtyard Stage and Stairs	No	Yes
3	Control Tower and Fire Day Station	No	Yes
4	Army-Navy Drive Offsite Parking Lots	Yes	Yes
N/A	REDACTED	REDACTED	REDACTED

Table ES-3 Master Plan Revision Projects: Circulation

#	Circulation	Shown on Map
1	Pentagon South Pedestrian Safety Project	Yes
2	Southeast Parking Project	Yes
3	North Parking Lot Improvements	Yes
4	Connector Road Bridge Upgrades	Yes
5	Connector Road and Boundary Channel Drive Intersection Improvements	Yes
6	Areawide Resurfacing and Rehabilitation	No
7	Areawide Sidewalk Improvements	No
8	Metro Entrance Pedestrian ACP	Yes
9	Pentagon Corridor 8 (COR8) Pedestrian ACP	Yes
10	Remote Delivery Facility Roof Project	Yes

Table ES-4 Master Plan Revision Projects: Environment and Sustainability

#	Environment and Sustainability	Shown on Map
1	South Secure Parking	Yes
2	Tree Box Filters	Yes
3	North Parking Bioretention	Yes
4	Old East Loading Dock	Yes
5	Corridor 5 Parking	Yes

Table ES-5 Master Plan Revision Projects: Energy

#	Energy	Mark Center Project	UESC Project	Shown on Map
N/A	REDACTED	REDACTED	REDACTED	REDACTED
2	Chiller Plant Upgrades	No	No	Yes
3	Thermal Energy Storage	No	No	Yes
4	Pilot Electric Vehicle (EV) Charge Stations	No	No	Yes
5	Pentagon-Wide Zero Emission Vehicle (ZEV) Fleet Infrastructure	No	No	No
6	Project Recommissioning/HVAC Efficiency Upgrade	No	No	No
N/A	REDACTED	REDACTED	REDACTED	REDACTED
8	Facility Related Control System (FRCS) Modernization	Yes	No	No
9	Light-Emitting Diode (LED) Lighting Upgrades	Yes	No	No
10	EV Charging Stations and Infrastructure	Yes	No	No
11	Optimize Data Center Performance	Yes	No	No
12	Variable Speed Primary Hot Water Pumping	Yes	No	No
13	Lighting Improvements	No	Yes	No
14	Domestic Water Improvements	No	Yes	No
15	Chilled Water Plant Improvements	No	Yes	No
16	Building Envelope Weatherization	No	Yes	No
17	Irrigation Improvements	No	Yes	No
18	Refrigeration Improvements	No	Yes	No

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Figure ES-1 Master Plan

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INTRODUCTION

1.1 MISSION

The mission of the United States (U.S.) Department of Defense (DoD) is “to provide the military forces needed to deter war and ensure our nation's security.” As the headquarters of the DoD, the Pentagon’s mission is to provide a working environment that enables the assigned military and civilian personnel to fulfill their mission. Approximately 26,560 personnel are currently assigned to the Pentagon. That number is forecasted to remain stable through 2025.

1.2 BUILDING HISTORY AND PLANNING PRECEDENTS

Conceived in 1941 as the country was preparing for entry into World War II, the Pentagon was completed in 1943 as home to the War Department. Following World War II and the creation of the DoD, the Pentagon became the DoD’s headquarters. In recognition of its historic significance, the Pentagon was placed on the Virginia Landmark Register and the National Register of Historic Places (NRHP) in 1989 and designated a National Historic Landmark (NHL) in 1992. [Section 2.1.2](#) provides additional information on the historic status of the Pentagon.

At the close of the 20th century, the Pentagon embarked upon a comprehensive renovation program to address a half century of wear and tear. This program was interrupted by the terrorist attack of September 11, 2001. The destroyed section of the Pentagon was rebuilt in 1 year and officially reopened on September 11, 2002. The remaining portions of the Pentagon renovations were completed in 2011.

Previous master planning has been conducted to provide a guiding framework for capital and facilities projects on the Pentagon site. The most recent comprehensive master planning effort was completed in 2005, and an update was completed in 2015–2016.



Figure 1-1 2005 Master Plan

1.3 2005 MASTER PLAN

The 2005 Master Plan, shown in [Figure 1-1](#), addressed changes and requirements that had occurred at the Pentagon since the previous plan for the campus was completed in 1991. These changes were significant, primary among them being the new security elements established after the 9/11 terrorist attack on the Pentagon building.

Other major features of the 2005 Master Plan included the following:

- » Establishment of a permanent secure perimeter around the Pentagon to control access and egress.
- » Construction of an improved heliport, incorporating all standard flight and operational requirements.
- » Consolidation of parking to provide additional open space. Parking structures with green roofs were recommended to consolidate parking and increase green space on the Pentagon campus.
- » Improvements to vehicular and pedestrian circulation to create a safer and more secure circulation system around the campus.
- » Enhanced sustainability strategies to promote the long-term environmental health of the Pentagon campus and its surroundings.
- » The creation of an industrial zone for like uses, centered on the heating and refrigeration plant (HRP).
- » A set of design guidelines to enhance and protect the aesthetic character and original design intent of the Pentagon building and grounds.

1.4 2016 MASTER PLAN UPDATE

In the years following the publication of the 2005 plan, several changes at the Pentagon campus occurred, creating the need for a revised and updated plan. These changes included new functions, such as the completion of the 9/11 Memorial, and changes to the campus facilities, such as new security measures, screening facilities, and vehicular and pedestrian circulation patterns. In 2016, a master plan update was completed that reexamined the 2005 Master Plan and incorporated the new features. Additionally, the plan was revised to reflect the funding constraints of the next 20 years. Many elements included in the 2005 Master Plan were removed in the 2016 update due to their implementation being forecasted beyond the 20-year planning horizon.

The goals established for the 2016 Master Plan Update sought to maintain, enhance, and optimize DoD Headquarters/Pentagon operations, specifically to:

- » Improve DoD Headquarters/Pentagon security,
- » Enhance the safety and quality of life of employees and visitors,
- » Enhance the environmental sustainability of the Pentagon campus, and
- » Balance the various planning factors/development pressures on the Pentagon campus, including funding, security, safety, public access, accessibility, historic preservation, being a good neighbor, and sustainability.

To achieve these goals, the 2016 update included specific projects as well as individual component plans for land use, security, circulation, environment and sustainability, and utilities. Planned projects were distributed among two phases of development: short-term (0-5 years) and long-term (6-20 years). Key elements updated from 2005 to 2016 include the following:

- » Sustainable parking design strategies prioritized the incorporation of stormwater management techniques into surface parking, rather than emphasizing parking structures with green roofs, which is more expensive and difficult to execute in the present funding environment.
- » The Sentry program, established to replace temporary screening and inspection facilities constructed after the 9/11 terrorist attack, will be completed to enhance security.
- » A major change in the South Parking Lot will improve the safety, security, and efficiency of vehicular and pedestrian circulation, create a strong pedestrian network, and improve sustainability features.
- » Planned pedestrian and bicycle circulation integrated external trail networks with internal routes on the campus, providing Pentagon employees clear paths between bicycle parking and pedestrian entrances.
- » Best management practice (BMP) strategies for handling stormwater on the campus will reduce the negative impact on waterways within the Chesapeake Bay Watershed and comply with the Pentagon's municipal separate storm sewer system (MS4) permit through the Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan, which was previously under development. The TMDL Action Plan will determine necessary total pollutant load reductions and the methods that will be implemented to achieve the reductions.
- » Newly incorporated sustainable strategies will enable the Pentagon campus to progress towards meeting the targets established in the DoD Strategic Sustainability Performance Plan (SSPP).



Figure 1-2 2016 Pentagon Master Plan Update

1.5 PURPOSE AND GOALS

While the 2016 Master Plan Update represented significant change over the 2005 Master Plan, this Master Plan Revision is not intended to reexamine the vision of the 2016 update. Rather, it is intended to carry the 2016 Master Plan Update forward and bridge the gap between the 2016 Master Plan Update and the upcoming full master planning exercise to occur approximately 5 years after the completion of this revision. This will be accomplished by:

- » Providing an update to the existing conditions and changes since 2016 and identifying related future projects. Future projects maintain the focus on the goals of the 2016 update as identified in [Section 1.4](#). In particular, the planned projects focus on environmental sustainability, security and climate resilience, and security for the DoD headquarters.
- » Identifying deficiencies in the existing plan in reference to the current (revision date: April 8, 2022) Unified Facilities Criteria (UFC) 2-100-01 and summarizing next steps to meet these requirements in the next comprehensive master planning effort.

This Master Plan Revision builds upon the 2016 Master Plan Update by expanding the analysis to include the Mark Center. The Mark Center, located in Alexandria, Virginia, is considered a part of the Pentagon campus and houses DoD personnel. Existing conditions for the Mark Center are described in [Chapter 2](#), and new efforts are identified in [Chapter 4](#).



Figure 1-3 Master Plan Illustrative Plan

1.6 PLANNING FACTORS

The planning factors established for the 2016 Master Plan Update are one key element carried forward. They formed the foundation of the planning that occurred for the 2016 Master Plan Update and influenced the projects that are included in this revision. The planning factors included in the 2016 Master Plan Update are revisited below.

While all factors remain vital, three factors—security, environmental protection and sustainability (with a particular emphasis on stormwater management), and transportation and circulation—are driving most of the planned projects in this update.



Security

Security remains one of the major factors influencing planning decisions at the Pentagon site. The terrorist attack of September 11, 2001 (9/11), led to revised security guidelines in the ensuing decade, and the recent events of January 6, 2021, have led the DoD to evaluate and adjust security measures and systems on a nearly continuous basis. This Master Plan Revision draws from those efforts and incorporates strategies to protect the employees, properties, and visitors to the Pentagon site to the maximum degree possible while balancing this need with other factors, such as public access to certain portions of the Pentagon campus, sustainability, and historic preservation considerations.



Environmental Protection and Sustainability

There are increasing and evolving requirements for federal agencies to accept greater accountability for their impacts on energy consumption, water quality, and overall sustainability. Many legislative actions, executive orders, and policies have established goals relating to the conservation of natural assets and protection of water resources, which are continuously changing and advancing to reflect new assessments of climate risks and technological advances.

In December 2021, Executive Order (EO) 14057 was released, which revoked EO 13834 and established that the Federal Government, including DoD, will lead by example to achieve a carbon-pollution-free electricity sector by 2035 and net-zero emissions economywide by 2050, using its scale and procurement power to achieve:

- 100 percent carbon-pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon-pollution-free electricity;
- 100 percent zero emission vehicle (ZEV) acquisitions by 2035, including 100 percent zero emission light-duty vehicle acquisitions by 2027;
- Net-zero emissions building portfolio by 2045, including a 50 percent emissions reduction by 2032;
- 65 percent reduction in scope 1 and 2 greenhouse gas (GHG) emissions from federal operations by 2030 from 2008 levels;
- Net-zero emissions from federal procurement, including a Buy Clean policy to promote use of construction materials with lower embodied emissions;

- Climate-resilient infrastructure and operations; and
- A climate- and sustainability-focused federal workforce.¹

In August 2010, DoD released the SSPP, which outlined goals and performance expectations for DoD facilities, establishing the path by which DoD will serve as the model of sustainability for the nation while enhancing its ability to achieve mission objectives. The SSPP was a primary source of guidance for the 2016 update. Following the 2016 update, sustainability guidance continued to evolve as a result of sustainability-focused EOs and DoD guidance.

The 2020 National Defense Authorization Act (NDAA), Section 2801, amended 10 U.S. Code (USC) 2864 and advanced the requirement for an installation climate resilience plan (ICRP). In 2021, the DoD published its climate adaptation plan. While this plan does not formally include an ICRP, it generally addresses all of the substantive requirements for an ICRP. In September 2020, UFC 2-100-01, Installation Master Planning, was updated to provide sustainability and resilience guidance. An additional update to UFC 2-100-01 was made in April 2022. UFC-2-100-01 and other relevant guidance for ICRP requirements will form the basis of the next comprehensive master planning effort. Section 3.7 of this report provides an overview of the requirements that will shape that exercise. The projects included in this update seek to advance the Pentagon site's sustainability and resilience requirements and reduce environmental impacts.

¹ Implementing Instructions for EO 14057 were published in August 2022 and can be reviewed at: https://www.sustainability.gov/pdfs/EO_14057_Implementing_Instructions.pdf



Stormwater Management

Stormwater management is an additional driver related to environmental protection and sustainability. Surface water quality is directly impacted by stormwater runoff. The stormwater impacts of land disturbance activities (i.e., construction, renovation, excavation) exceeding 2,500 square feet (SF) are regulated by federal, state, and/or local stormwater management requirements that stem from the Clean Water Act. These regulations are in place to ensure that waterways and water sources are protected from pollutants carried by stormwater runoff. Due to the Pentagon's location near the Potomac River and within the Chesapeake Bay Watershed, land-disturbing activities on the Pentagon campus are subject to additional regulations. Stormwater quality and pollutant reduction requirements must be met for the Pentagon site, whether land is disturbed or not. Further, per the Energy Independence and Security Act (EISA), Section 438, the DoD maintains predevelopment hydrology to the maximum extent technically feasible for all development and redevelopment projects exceeding 5,000 SF of disturbance. The Master Plan Revision incorporates strategies, projects, and plans to minimize the impact of stormwater runoff and to comply with these regulations.



Transportation/Circulation

Transportation to and from, and circulation around, the Pentagon, Pentagon Transit Center (PTC), and 9/11 Memorial heavily influence the Master Plan Revision. In addition to approximately 26,560 employees who work on site at the Pentagon site, numerous guests from across the country come to visit the 9/11 Memorial and Pentagon building. The Pentagon is also located in a busy urban environment that is more dependent on transit, bicycle, and pedestrian circulation than ever.

For these reasons, a Transportation Management Plan (TMP) was prepared in parallel with the 2016 Master Plan Update to provide a comprehensive set of actions to reduce traffic congestion and improve air quality affecting the Pentagon campus study area. While the TMP focused on identifying actions to facilitate employee multimodal transportation, the master plan integrated transportation considerations into the wider context of the campuswide master plan. The projects included in this update generally continue the efforts outlined in the 2016 update.



Historical Context

The Pentagon was listed in the NRHP in 1989 (with an update in 2023) and designated an NHL in 1992 under criteria established by the National Historic Preservation Act (NHPA) as administered by the National Park Service and the Commonwealth of Virginia's State Historic Preservation Office (SHPO). Per the 2023 NRHP update, the Pentagon Courtyard, Mall Terrace, River Terrace, PLC2, and 9/11 Memorial are also designated as historic properties. As with the 2016 Master Plan Update, this update seeks to respect the historic nature of the Pentagon while providing for the future.



Community Coordination

The Pentagon campus does not have a continuous perimeter fence line, as is customary at other DoD installations. Rather, the Pentagon's layered approach to security incorporates fencing along an inner perimeter, with 24-hour monitoring procedures across the campus via sophisticated technologies.

Another distinct feature is that the PTC, one of the largest regional transit hubs in the metropolitan area, is located within the Pentagon campus boundary, serving not only the employees of the Pentagon but other commuters throughout the region. As an iconic representation of our nation's defense, the Pentagon attracts visitors with varied points of interest. The 9/11 Memorial is a prominent destination within the campus boundary, along with the neighboring United States (U.S.) Air Force Memorial and Lyndon Baines Johnson (LBJ) Memorial Grove. Additionally, multiuse trails along eastern and western edges of the site attract pedestrians and bicyclists. Master planning at the Pentagon needs to account for a greater level of public access and activity.

1.7 PLANNING METHODOLOGY

Preparation of this revision was consistent with the stated purpose of the effort: to provide a document that summarizes changes since the 2016 update, provides a list of planned projects, and serves as a bridge to the next comprehensive planning effort to be completed within approximately 5 years of the adoption of this revision.

WHS prepared an environmental assessment (EA) pursuant to the National Environmental Policy Act (NEPA) to analyze impacts to the environment resulting from the implementation of the 2016 Master Plan Update. The EA was developed in parallel with the master plan update process and reviewed by similar stakeholders.

1

Project Initiation

The project was initiated via a kickoff meeting with internal Pentagon stakeholders. Project initiation included confirmation of the revision purpose in Section 1.3.

2

Data Collection

The project team gathered data on existing conditions and future projects from stakeholders. In addition, the team attended several site visits and held meetings with stakeholders.

3

Existing Conditions Analysis

The existing conditions analysis included a review of data collected, site visits, and stakeholder discussions. Results of the existing conditions analysis are presented under the following:

- » Site, size, condition, amenities and visual quality
- » Climate
- » Existing land use and facilities
- » Circulation, including vehicular, transit, pedestrian, and bicycle
- » Security features
- » Physical/natural features
- » Environmental
- » Historic resources
- » External projects (projects surrounding the Pentagon campus being conducted or proposed by other agencies)

4

Identification of Future Projects

Future projects consistent with the master plan purpose were identified via stakeholder-provided information and discussions. Projects were identified, located, and described under the following:

- » **Land Use/Facilities** – These include proposed changes to the land use pattern as well as any proposed new facilities.
- » **Security** – Projects including vehicle barriers, pedestrian barriers, intrusion detection systems, and access control were included.
- » **Transportation** – Projects planned and proposed to enhance circulation on the Pentagon campus were noted as transportation projects.
- » **Environment and Sustainability** – These include projects proposed to enhance environmental stewardship and improve sustainability.
- » **Energy** – Many strategies and projects that promote energy conservation are included among the transportation projects, as well as under environment and sustainability projects. Other energy projects and strategies are included here.

5

Pre-draft Master Plan Revision and Work Sessions

A pre-draft master plan revision was developed, incorporating the existing conditions analysis as well as identified future projects. This pre-draft was reviewed internally and refined with stakeholders via work sessions. The draft was also discussed with external stakeholders to expand upon information gained during data collection. See [NCPC Review Process](#) ▶

6

Draft Master Plan Revision: Internal Review

The 95 percent draft incorporated the input received during the pre-draft work sessions. The plan was distributed for formal review to internal stakeholders.

7

Draft Master Plan Revision: External Review and Draft EA

Following the internal review, the revised 95 percent draft was distributed and presented to external stakeholders for review and comment. Additional information on the external review process is contained in Section 1.8.

8

Final Master Plan Revision and Final EA

Input from external stakeholders was incorporated into the draft document to create the final revision. The final revision will be submitted for formal review by external stakeholders and review under an EA process.

NCPC REVIEW

The National Capital Planning Commission (NCPC) requires master plans for campus developments or military installations with more than one principal building. Approved master plans are required prior to the development of individual building and site projects. The Planning Act requires that NCPC use master plans as a guide for reviewing development on campuses/institutions. New and major modifications to master plans are subject to intergovernmental referral, meaning they are transmitted to local and state government agencies for input. NCPC review of master plans generally follows the same stages of review as for other types of projects discussed in NCPC's Submission Process Overview guidelines. However, the information required for master plans is different from what is required for specific projects due to the scope and long-term nature of master planning. Therefore, NCPC has developed separate submission guidelines specifically for master plans. NCPC only has an advisory role outside of the District of Columbia.

NCPC REVIEW PROCESS

Pre-Submission Briefing

Applicant schedules and attends Pre-Submission Briefing with NCPC staff. Applicant receives feedback from NCPC staff to guide project formulation and submission process.

Concept Review

(If applicable.) Commission provides input into project alternatives and the general consistency of the alternatives with NCPC policies.

Preliminary Review

Commission reviews the project for consistency with NCPC plans and policies and planning principles.

Final Review

Commission confirms the design details developed since Preliminary Review.

Source: <http://www.ncpc.gov/review/guidelines>

1.8 COORDINATION WITH EXTERNAL REVIEW AGENCIES

During data collection and through the pre-draft master plan revision, the team consulted with external agencies that have a stake in this master plan. External stakeholders consulted included the NCPC, Arlington County, and the Arlington National Cemetery. In addition to these stakeholders, the external stakeholders consulted in the **Draft Master Plan Revision: External Review and Draft EA** included the Commission on Fine Arts (CFA), Virginia Department of Historic Resources (VDHR), Virginia Department of Transportation (VDOT), and Washington Metropolitan Area Transit Authority (WMATA).



ANC



Arlington County



GFA



NCPC



VDHR



VDOT



WMATA

Figure 2-1 Aerial View of the Pentagon and Mark Center (inset), Arlington County, Virginia



EXISTING CONDITIONS

2.1 INTRODUCTION

THE PENTAGON AND SURROUNDING AREA CAN BE SEEN IN THE AERIAL VIEW IN FIGURE 2-1.

CHAPTER 2 DESCRIBES THE EXISTING CONDITIONS AT THE PENTAGON CAMPUS.

THESE EXISTING CONDITIONS PROVIDED THE FRAMEWORK FOR DEVELOPING THE MASTER PLAN PROJECTS DESCRIBED IN CHAPTER 3.



2.1.1 SIZE AND VISTAS

No changes were made to the land area of the Pentagon site, and the area remains approximately 245 acres. Views of the Pentagon have not been impacted by external projects and remain as described in the 2016 update and below.

Situated along the Potomac River in Arlington County, Virginia, the Pentagon site sits within the Monumental Core and ‘topographic bowl’ of the Nation’s Capital (see [Figure 2-2](#)). The Pentagon campus is bounded by Route 27 (Washington Boulevard) and Arlington National Cemetery (ANC) to the west, Boundary Channel Drive and the Pentagon Lagoon to the east, and Interstate 395 (I-395) to the south. Route 110 bisects the campus in a north-south direction. These roads provide multiple viewsheds for travelers to see the Pentagon campus and building.

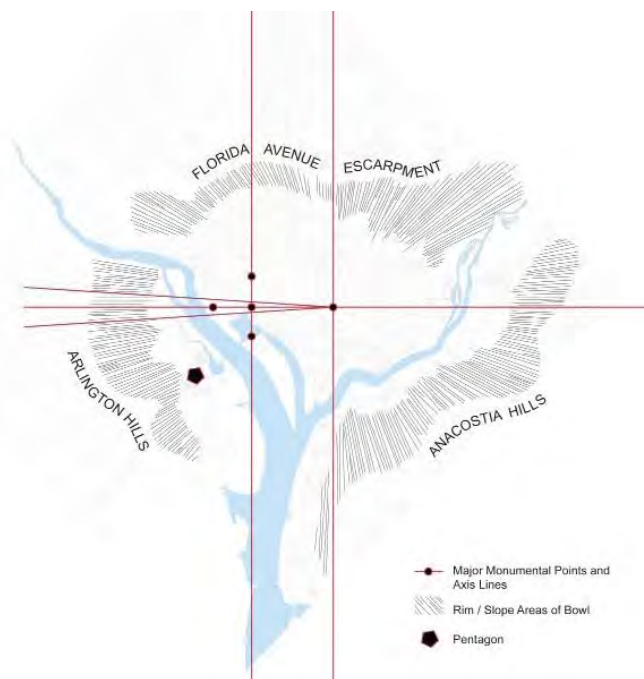
The Pentagon building itself is, by far, the most pronounced feature on the campus, covering roughly 35 acres. The Pentagon is adjoined by the Remote Delivery Facility (RDF) to the north and the Metro Entrance Facility (MEF) and Pentagon Transit Center (PTC) to the southeast. The majority of the remaining areas of the campus consist of surface parking and roadways with a number of smaller support structures situated throughout.

The Pentagon site is relatively flat, exhibiting little topographic relief. A number of small, landscaped areas, which consist primarily of turf grass and small trees, are found throughout the site. Overall, very little native vegetation exists on the campus, with the exception of the shore of the Pentagon Lagoon.

The primary vistas into the campus are from ANC from the west, the Humpback Bridge (George Washington Parkway) from the east, and I-395 from the south. Views are also possible from adjacent roadways Route 27, Route 110, and Boundary Channel Drive. [Figure 2-3](#) shows the primary vistas into the Pentagon site from these roadways. The Pentagon site is also highly visible from the air, with passengers on flights arriving and departing from Ronald Reagan National Airport having birds eye views along the typical flight paths that follow the Potomac. The most significant view from Arlington National Cemetery originates from the Arlington House site, which reveals the majority of the northern portion of the campus.

Views from other areas within the cemetery, and from roadways along the western side, are partially screened by topography, vegetation, and the barrier wall along Route 27. As I-395 is elevated near the Pentagon site, views from both the southwest and southeast from this roadway are completely unscreened. The Pentagon building is directly visible, as well as parking and transit areas, the heating and refrigeration plant (HRP), River Terrace, and other landscaped areas. Boundary Channel Drive and the George Washington Memorial Parkway both offer views of the Pentagon building and River Terrace from the east. More distant views are possible from Washington, DC, to the east, but they are mostly obscured by the tree canopy along the Potomac River and Pentagon Lagoon shoreline. Photos of the primary views are shown in [Figure 2-4](#).

Figure 2-2 Relationship between the Pentagon and the Monumental Core and Topographic Bowl of the Capitol



Source: National Capital Planning Commission's Monumental Core Framework Plan

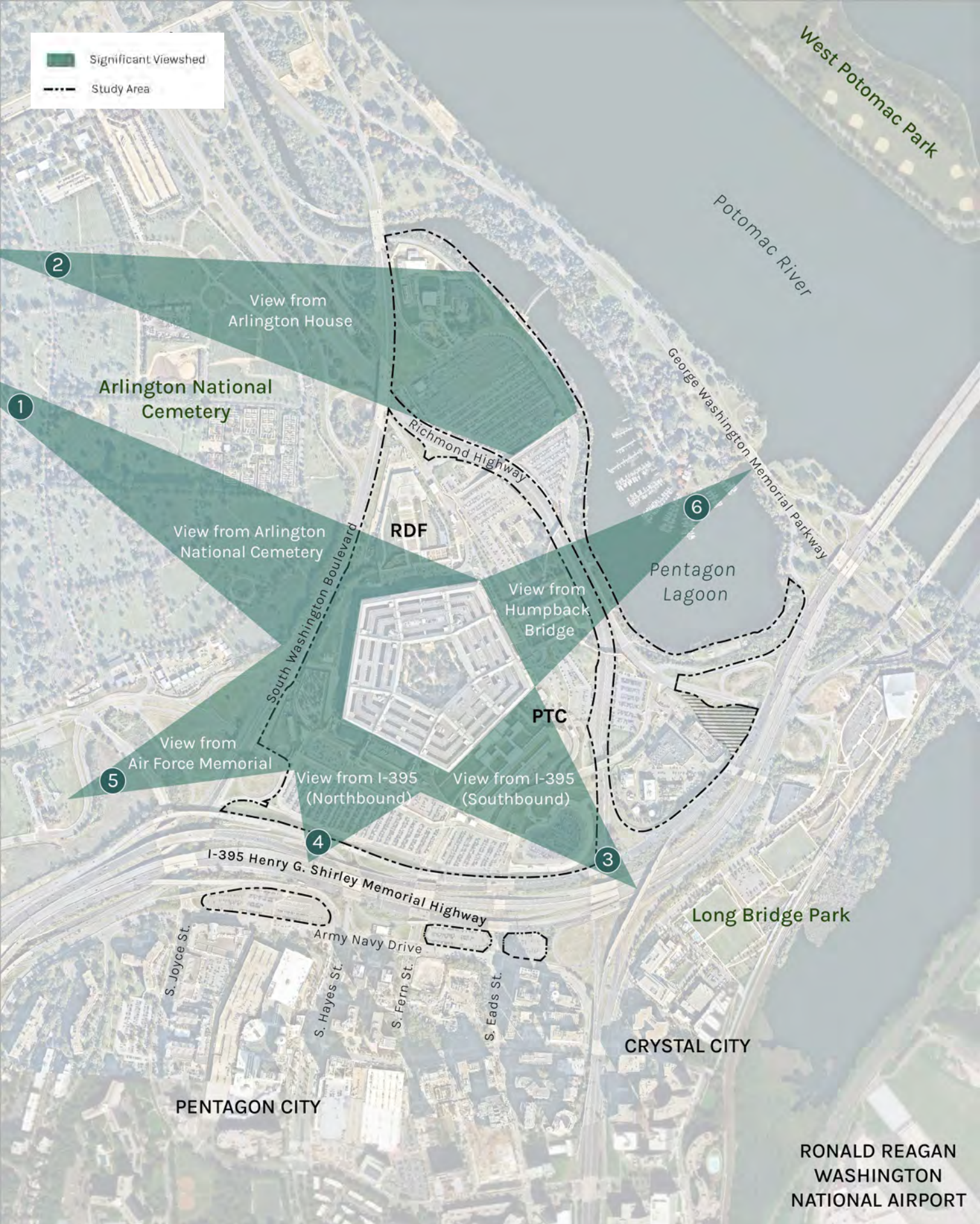


Figure 2-3 Key Views of the Pentagon

Source: National Capital Planning Commission's Monumental Core Framework Plan



View of the Pentagon Building from Arlington National Cemetery



View of North Parking from Arlington House, Arlington National Cemetery



View of the Pentagon Building from I-395



View of the Pentagon Building from I-395 (Google Earth)



View of the Pentagon Building from the Air Force Memorial



View of the Pentagon Building from Humpback Bridge

Figure 2-4 Key Views of the Pentagon Building Photos

2.1.2 HISTORIC AND CULTURAL RESOURCES

The Pentagon is one of the most distinctive and recognizable buildings in the world and is widely regarded as a symbol of the strength of the U.S. military. The Pentagon was designed to accommodate up to 40,000 workers and includes the major headquarters components of the DoD as well as the offices of the most senior DoD officials, including the Secretary of Defense, the secretaries of the three military departments, and the Joint Chiefs of Staff. The Pentagon was built from September 1941 to January 1943 to consolidate the rapidly growing War Department under one roof. The mounting pressure of World War II forced the urgency of both the consolidation and the construction.

Built primarily on the site of the Washington-Hoover Airport, over 4,000 workers labored in three shifts, 24 hours per day, to construct the massive 6.6 million (M) SF-building, motivated by the threat of oncoming World War II. Hastily planned, crews broke ground the day contracts were signed, and engineers and architects were finalizing the design even as the walls of the Pentagon were being built around them. Early designs from mid-1941 show the same five-sided plan reminiscent of early star-shaped forts with the interior courtyard; however, the barracks-like interior structure was changed to the now-familiar series of five concentric rings among five floors. At the time, the Pentagon site covered 583 acres, 29 of which are occupied by the Pentagon itself. (Three hundred acres were transferred to Fort Myer and Arlington National Cemetery. The Pentagon site is now approximately 245 acres.) Sixty-seven acres of parking lots were originally designed to accommodate about 10,000 vehicles.¹

Before the Pentagon's construction, the adjacent land to the west at Arlington National Cemetery was home to an African American community called Freedman's Village. In 1863, the federal government and several charities established Freedman's Village as a housing area for displaced and formerly enslaved people on the Arlington Plantation.^{2,3} The federal government treated the community as temporary, but inhabitants established semi-permanent residences.² After residents successfully resisted the government's attempt at closing the village in 1868, Freedman's Village continued to grow into a stable community, with shops, churches, and a school.² Freedman's Village consisted of 124 dwellings, three shops, two churches, one school, and 170 families with a total population of 763 by 1888.² However, in order to expand Arlington National Cemetery, the federal government vacated the land in 1887 and residents of the former Freedman's Village established and moved to neighborhoods including Queen City (located on the west end of the Pentagon site), East Arlington, and Johnson's Hill.^{2,3}

¹ Goldberg, et. al, *Pentagon 9/11* (Washington, DC: Historical Office, Office of the Secretary of Defense, 2007), 2-3.

² Arlington County Department of Community Planning, Housing and Development. 2016. *A Guide to the African American Heritage of Arlington County, Virginia*. Arlington County Historic Preservation Program. Second Edition.

³ NPS. 2023. *National Register of Historic Places Registration for the Pentagon*. March 21, 2023.



Pentagon Designers



Early Model of the Pentagon



Construction on the First Side of the Pentagon, November 5, 1941



View from the Arlington Radio Towers, Date Unknown, Looking East Showing Part of Johnson's Hill, Columbia Pike, and East Arlington Prior to the Construction of the Pentagon

Upon the closing of Freedman's Village, many residents moved to an area that would later be called East Arlington.² In the 1890's, the former board of trustees of Freedman's Village bought a small parcel in southeastern Arlington just outside of Freedman's Village's former boundaries and established houses and a church to form the Queen City neighborhood.^{2,4} While the land on which Queen City laid was prone to flooding, its location provided residents easy access to Washington, D.C. and Alexandria, Virginia via roads and rail.⁴ Soon after Queen City was established, the former Freedman's Village board of trustees established a second, smaller community adjacent to Queen City called East Arlington. From the early 1900's through the 1930's, Queen City and East Arlington grew into stable communities, similar to Freedman's Village. They were home to several establishments, including three groceries stores, a shoe-repair shop, and two churches. In 1940, 903 individuals lived in 218 households within the neighborhoods.⁵

In 1941 and 1942, to provide sufficient space to accommodate the Pentagon road network, parking lots, and water and sewer system, the federal government evoked eminent domain on East Arlington, Queen City, and other nearby African American communities around the former airport. Culturally significant buildings and other infrastructure in these neighborhoods were either relocated, such as Mount Zion Baptist Church on Johnson's Hill, or were demolished. Construction of the Pentagon resulted in the relocation of over 900 residents, most or all of whom were African American, within two months of receiving notice to move.² Residents of the Queen City and East Arlington neighborhoods, for example, were given less than a month to evacuate, but the federal government began construction in these neighborhoods before the deadline to move.

⁴ Bestebreurtje. 2017. Built by the People Themselves - African American Community Development in Arlington, Virginia, from the Civil War through Civil Rights. March 27, 2017. Available at: http://mars.gmu.edu/bitstream/handle/1920/11125/Bestebreurtje_gmu_0883E_11369.pdf. Accessed on September 27, 2023.

⁵ Perry, N. 2016. Eminent Domain Destroys a Community: Leveling East Arlington to make way for the Pentagon. *Urban Geography*, 37 (1), 141-161. <https://doi.org/10.1080/02723638.2015.1100953>. Accessed on September 27, 2023.



Map of Alexandria County, Virginia, for the Virginia Title Company, 1900.

Only those who owned homes, estimated to be at 40 percent, received compensation for their property. The remaining 128 households who rented their homes did not receive compensation. The government provided a total compensation of \$369,427 (\$5,351,456 in 2015 dollars) portioned out to the property owners.⁵ Beyond loss of land and home, residents lost possessions and their sense of community as a direct result of the forced relocation.⁵

In 1942, after a plea from a local attorney representing the community, First Lady Eleanor Roosevelt became involved and facilitated temporary housing in the newly established Arlington Trailer Camp and the Green Valley Trailer Camp for residents who had not found other housing. However, the camp conditions were so poor that many parts of the Arlington Trailer Camp were abandoned by 1943. The federal government disbanded the Green Valley Trailer Camp by 1949. The government also dumped construction garbage from the Pentagon into ravines at Johnson's Hill.²



Freedman's Village, African American Adults and Children Reading Books in Front of their Barracks, CA. 1864-1865

Despite continuous displacements spurred by the federal government, former residents of Freedman's Village, East Arlington, Queen City, and other displaced African American communities persevered and continue to do so today. In 1964, members of Johnson's Hill (now Arlington View) successfully lobbied the Arlington County government to legally protect and preserve their new communities under Arlington County's newly-established Neighborhood Conservation Program (now called the Arlington Neighborhoods Program).^{2,4}

The Pentagon is committed to exploring ways to memorialize the history of the land through educational programming and signage on-site. Future projects to be evaluated may include historical markers, self-guided tour routes, or public art and monuments. WHS will work closely with Arlington County, VDHR, and those connected to this history to determine the most appropriate course of action.

Over the years, the Pentagon has undergone various additions and improvements. Significant changes to the campus have included the addition of the WMATA's Pentagon Metro Station; addition of the RDF; modernization and addition of the HRP; and addition of the south entrance bridges, MEF, and PTC.

In 1994, the DoD obtained \$1.218 billion from Congress to start what would become known as the Pentagon Renovation Program (PENREN). This extensive program resulted in the modernization of the Pentagon, including complete structural and building systems renovation, information technology and security improvements, and accommodations to meet the requirements of the Architectural Barriers Act (ABA). PENREN completely updated 6.5 million SF of the building, wedge by wedge, while remaining operational 24/7 during all phases of demolition and renovation.⁶



View of the North Side of the Pentagon, 1964



The Pentagon, September 12, 2001

On September 11, 2001, at 9:37 a.m., 60 years to the date of the Pentagon's groundbreaking, hijacked American Airlines Flight 77 struck the west wall of the Pentagon. The damage to the Pentagon from the terrorist attack was extensive. Flight 77 crashed into the first floor inside Wedge 1 and penetrated into C Ring. The resultant fireball caused the collapse of four floors in the E Ring, above the impact point. The collapse caused a hole approximately 95 feet wide and 50 feet deep from the outside to the extant wall inside E Ring. The design and materials used in the construction of the Pentagon, as well as the fire safety improvements, structural reinforcement, and blast-resistant windows from PENREN contributed to the strength and resiliency of the building, limiting interior destruction and also likely reducing the loss of life, which included the 64 passengers on the plane and 125 people from the Pentagon itself.⁷ However, damage due to fire, smoke, water, and mold was extensive through Wedges 1 and 2.⁸

The PENREN office took over the demolition, reconstruction, and renovation of the damaged area, which totaled about 400,000 SF. Reconstruction involved 3,000 construction workers in two 10-hour shifts, 6 days a week.⁹ About 66 percent of the Pentagon was reoccupied by September 24, 2001. Full occupancy was completed in February 2003, and the PENREN continued renovations with increased funding from Congress.¹⁰ The PENREN program was completed in 2011, 3 years ahead of plan.¹¹ The 9/11 Memorial was dedicated on September 11, 2008. Located on the southwest side of the building near where the plane struck the Pentagon, the 2-acre memorial allows for peaceful reflection and a place to honor those who died on 9/11.¹²

⁶ Historical Office, Office of the Secretary of Defense, "Pentagon Renovations," <https://history.defense.gov/DoD-History/Pentagon/Renovations>, accessed July 21, 2022.

⁷ Goldberg, et. al, Pentagon 9/11 (Washington, DC: Historical Office, Office of the Secretary of Defense, 2007), 18-19.

⁸ Ibid, 202.

⁹ Historical Office, Office of the Secretary of Defense, "Pentagon Renovations," <https://history.defense.gov/DoD-History/Pentagon/Renovations>, accessed July 21, 2022.

¹⁰ Goldberg, et. al, Pentagon 9/11 (Washington, DC: Historical Office, Office of the Secretary of Defense, 2007), 201-203.

¹¹ Historical Office, Office of the Secretary of Defense, "Pentagon Renovations," <https://history.defense.gov/DoD-History/Pentagon/Renovations>, accessed July 21, 2022.

¹² Katie Lange, "Pentagon History: 7 Big Things to Know," <https://www.defense.gov/News/Feature-Stories/story/Article/1867440/Pentagon-history-7-big-things-to-know>, December 19, 2019.

HISTORICAL DESIGNATION

The Pentagon Office Building Complex (the Pentagon) (VDHR ID 000-0072) was listed in the NRHP and the Virginia Landmarks Register in 1989. It was designated in 1992 as an NHL (see [Figure 2-5](#)).

The Pentagon is significant under NRHP criteria A, B, and C. Under criterion A, the Pentagon's construction on the eve of World War II is representative of the rapid expansion of the U.S. military between 1940 and 1941 and is both a symbolic and a physical representation of the United States' emergence as an international military "superpower." It is closely linked to the establishment of the U.S. national defense, having been the headquarters of the War Department since 1943, as well as the DoD since its creation in 1947. The Pentagon has been associated with innumerable events regarding the command and management of the armed services from World War II to the present day. The building has been the setting for decision-making and command processes which have been, and continue to be, of paramount importance to the national security and history of the United States.

Under criterion B, the Pentagon is associated with many persons who are significant to the modern period of the history of the United States. Since 1947, virtually every major figure associated with the DoD has occupied an office in the Pentagon. These include the men and women who have been the leaders of the U.S. Army and Air Force from World War II to the present, and of the U.S. Navy since its incorporation into the DoD. These include General George C. Marshall, Chief of Staff of the Army during World War II and later Secretary of State under President Truman; the first Secretary of Defense, James V. Forrestal, who directed the merger of the armed services departments into the modern DoD; General and President Dwight D. Eisenhower; Admiral Hyman Rickover; Air Force General Curtis LeMay; and former Secretary of Defense Robert McNamara. Significantly, from the 1940s to the present day, every individual who has been Secretary of the Departments of Defense, Army, Navy, and Air Force, as well as virtually every senior officer of the American military establishment, has worked in the Pentagon for a portion of their careers.

The architectural significance of the Pentagon under criterion C is largely due to it being one of the largest and last of Washington, DC's, monumental buildings designed according to the principles set forth by the 1902 Senate Parks Commission, more commonly known as the McMillan Commission. The Pentagon also derives significance from being the last major public building designed in the "stripped classical" style that was typical of the period for federal architecture in Washington, DC.

In 2023, WHS updated the NRHP listing for the Pentagon Historic District. This update documents significant events and projects that have occurred at the Pentagon since its last update in 1989, specifically: the PENREN program, the events of 9/11, the Phoenix Project to rebuild the west façade, and the 9/11 Memorial. The updates also clarify and adjust the Pentagon Historic District boundary to include the PLC2 and the 9/11 Memorial as contributing resources to the district and identify character-defining features for each contributing resource. Based on the 2023 updated NRHP listing, the Pentagon Historic District boundary contains the following six contributing resources: the Pentagon Office Building, Pentagon Courtyard, Mall Terrace, River Terrace, PLC2, and 9/11 Memorial. WHS intends to update the 1992 NHL listing to align with the 2023 updated NRHP listing.

Several cultural resources investigations have occurred on or near the Pentagon site, which have identified historic and cultural resources including archaeological site VDHR ID 44AX0028, the Alexandria Canal. Site 44AX0028 runs roughly through the center of the Pentagon and has not been evaluated for listing in the NRHP. However, the canal has been entirely destroyed by modern development in the vicinity of the Pentagon, and any portion of the site within the Pentagon site would not contribute to the overall eligibility of site 44AX0028. In 2022, WHS conducted an archaeological inventory study for the Pentagon site and the Mark Center and determined that neither site has the potential for intact archaeological resources. VDHR concurred with this finding.



Sections of E, D, and C Rings Removed from West Side for Reconstruction after 9/11 Terrorist Attack, February 6, 2002

RECOMMENDATIONS FOR CULTURAL RESOURCES MANAGEMENT

Section 106 Compliance and Integrated Cultural Resources Management Plan (ICRMP) Development

Section 106 of the NHPA requires federal agencies to establish their own historic preservation programs for the identification, evaluation, and protection of historic properties. As noted in the previous section, WHS recently completed an archaeological inventory study for the Pentagon site and the Mark Center as well as a comprehensive update to the NRHP eligibility documentation for the entire Pentagon campus. Based on this updated inventory of historic properties, WHS plans to develop an ICRMP for the Pentagon site and the Mark Center. An ICRMP is a 5-year planning document that is used to implement a cultural resources management program. An ICRMP can define and categorize ongoing or planned actions that could affect cultural resources; refine and update standard procedures for project reviews, records management, and preservation and preventative maintenance efforts; discuss integration with other plans, such as master plans and programmatic agreements; identify potential conflicts between management decisions or mission impacts on cultural resources; and identify compliance actions related to cultural resources. WHS anticipates finalizing the ICRMP prior to the next iteration of the master plan.

Consultation

In addition to Section 106 compliance, certain projects and activities at the Pentagon campus are also subject to review by the NCPC and the CFA. WHS recognizes that it would be beneficial to develop an alternative review process for minor projects at the Pentagon campus that have minimal potential to adversely affect historic properties. WHS is in the process of developing a programmatic agreement that would define types of projects and activities at the Pentagon site and the Mark Center that could be excluded from Section 106 review. This would streamline project reviews and result in expedited compliance timelines. WHS will coordinate this effort with VDHR and other consulting parties and anticipates finalizing the programmatic agreement prior to the next iteration of the master plan.



Figure 2-5 Pentagon Historic Resources

Note: The boundary depicted on this map is for illustration only. Precise NHL boundary can be found in NRHP materials.

2.1.3 REGIONAL CONTEXT

URBAN DESIGN FRAMEWORK

The urban design framework for the Pentagon is an important tool to guide future development on the site. This framework is consistent with that established in 2016 and provides five criteria that should be considered when planning, designing, and implementing new projects. Displayed in [Figure 2-6](#), the Urban Design Framework diagram illustrates the key elements described below:

1. Historic Property and National Historic Landmark

The Pentagon building is, and will remain, the most prominent feature on the campus. As a historic property and an NHL, the building and its immediate surroundings, including the River Terrace, are to be preserved to maintain historic integrity. Changes to the facilities should blend in with the Pentagon's architectural qualities and respect historic design standards, noting the materials, design motifs, and impacts of development on historic features. The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (2017) provides guidance for any changes to structures within the NHL.

2. Security and Access

Maintaining a secure perimeter is integral to the operations of the Pentagon site. Multiple layers of security separate public and restricted areas, whose distribution define mobility patterns on the campus. These security measures impact the character and quality of different areas in the Pentagon campus, particularly where fencing, security checkpoints, Pentagon Force Protection Agency (PFPA) officers, and other measures are highly visible. Future development should reinforce the boundary between publicly accessible and restricted areas in a thoughtful manner. Barriers, signage, and circulation routes should clearly delineate accessibility in their design. [Section 2.4](#) addresses the existing security measures on the Pentagon site.

3. Pentagon Site Boundary

The Pentagon site's federally controlled boundaries are defined by man-made and natural features, which are respectively characterized as hard edges and soft edges. Hard edges include roadways, bridges, walls, and other structures. In some cases, these hard edges not only create a boundary but bisect portions of the campus, the most significant being Route 110 and I-395. Soft edges include natural features, such as green space and water bodies. Physical boundary features help to define the Pentagon campus area for visitors and provide places to control access.

4. Physical Setting

The Pentagon site is located within close proximity to a number of significant natural features, recreational amenities, and national monuments and memorials. Green space and access to water features are important qualities of the campus. Natural areas, park space, and waterways provide amenities for users and play an important function in managing environmental impacts. Adjacent water bodies include the Potomac River, Pentagon Lagoon, Boundary Channel, and Roaches Run. Parks and recreation areas nearby include the George Washington Memorial Parkway, the Columbia Island Marina, and Long Bridge Park. Monuments and memorials near the Pentagon site include Arlington National Cemetery, the LBJ Memorial Grove, and the Air Force Memorial. Key connections to these nearby assets should be reinforced and expanded where possible.

5. Significant Viewsheds

Significant views of the Pentagon site from nearby locations are described in detail in [Section 2.1.1](#). These viewsheds are highly visible areas that should be preserved and considered when planning for future development on the campus.



Figure 2-6 Pentagon Urban Design Framework

COMMUNITY CONTEXT AND EXTERNAL PROJECTS

While the general land use pattern surrounding the Pentagon site has remained largely unchanged since the 2016 update, significant projects have occurred, are under construction, or are planned. These projects are indicated in [Table 2-1](#) and [Figure 2-7](#).

Extending west of the campus down Columbia Pike are Arlington National Cemetery (ANC), the Air Force Memorial, the former Federal Office Building 2 (FOB 2) site, and Joint Base Fort Meyer – Henderson Hall. ANC is roughly 612 acres of historic landscape. The ANC Real Property Master Plan includes future development to add burial capacity, facilitate cemetery operations, enhance family services and visitor experience, and promote sustainability. The proposed project with the most direct connection to the Pentagon is the proposed 9/11 Memorial Visitor Center. This project is still in the planning stages, with a proposed general location along Columbia Pike, just west of South Washington Boulevard.

Construction is underway to realign Columbia Pike through the former FOB2 area, connecting directly to South Joyce Street. The modification and repair of the Route 27 overpass over Route 110 has been completed, providing space for a shared-use path and wider sidewalk. The Arlington Memorial Trail between Arlington National cemetery and Route 110 will connect the realigned Columbia Pike with Memorial Avenue and will fill a key missing link in the National Capital Regional Trail Network. The ANC Southern Expansion will also occur in this area.

South of the Pentagon site lie Pentagon City and Crystal City, mixed-use districts consisting of high-density residential, retail, and commercial office complexes. This area has long been connected to the Pentagon, providing both office space for businesses serving the DoD, and retail amenities for Pentagon occupants and visitors. In 2019, Amazon announced that Pentagon City (with a proposed rebranding of Crystal City as National Landing) would be home to its second corporate headquarters (HQ2) project. This project will bring over 4 million SF of new office space immediately south of Army-Navy Drive, between South Fern Street and South Eads Street, significantly impacting the regional economy and real estate market. The large scale of this neighboring development could drive interest in developing the Pentagon site's surface parking areas along Army Navy Drive.



9/11 Memorial Visitor Center



Amazon HQ2



Long Bridge Aquatics and Fitness Center



Long Bridge Rail Pedestrian/Bike Bridge

Although I-395 creates a significant barrier between Pentagon City and the Pentagon site, there are multiple pedestrian and vehicular connections between the two areas. Improvements to the I-395 and South Eads Street interchange were completed prior to the 2016 update to better accommodate local traffic. Additional roadway improvement projects are also being planned, including Army Navy Drive multimodal improvements, 12th Street corridor improvements, Columbia Pike multimodal improvements, South Eads Street complete streets improvements, South Clark and South Bell Streets reconfigurations, and Pentagon City multimodal improvements.

Southeast of the Pentagon campus, Long Bridge Park has been completed, creating a significant community recreation area on a formerly vacant site. Phase I of the park was completed in 2011 with three lighted synthetic-turf athletic fields, a network of walkways, a rain garden, public art, and public green space. In 2021, the Long Bridge Aquatics and Fitness Center opened. This 92,000 SF-facility serves as both a recreational resource and host to competitive swimming and diving events with a 50-meter pool and 1-meter, 3-meter, and 5-meter high-dive towers. Beyond the park lie Roaches Run Waterfowl Sanctuary and Ronald Reagan Washington National Airport. Adjacent to Long Bridge Park, the Virginia Passenger Rail Authority is developing plans to improve the Long Bridge rail bridge and corridor, which currently serve freight and passenger rail, including Amtrak and Virginia Railway Express (VRE). The project would also include a new bicycle and pedestrian bridge between Arlington, near the Long Bridge Aquatic Center, and Washington, DC. Bicycle and pedestrian improvements to Long Bridge Drive are being planned to connect the pedestrian/bike ways of the Long Bridge Rail Project to the Crystal City bike network.

To the east of the Pentagon campus are Boundary Channel, the Pentagon Lagoon, Columbia Island, and the George Washington Memorial Parkway. Improvements to the Humpback Bridge and a new shared-use underpass path were completed prior to the 2016 update. Modification of the Boundary Channel Drive/I-395 interchange is under construction and will serve the Long Bridge Park Aquatics and Fitness Center and the recently completed Long Bridge outdoor recreation park. The project will improve pedestrian and bicycle access to Boundary Channel Drive and the Pentagon building for Pentagon employees.

Table 2-1 Key External Projects

ID	Project	Primary Organization	Status
1	9/11 Memorial Visitor Center	The Pentagon Memorial Fund	Planned
2	Realignment of Columbia Pike	Arlington County	Under Construction
3	Amazon Second Corporate Headquarters (HQ2) Project	Amazon	Under Construction
4	Long Bridge Aquatics and Fitness Center	Arlington County	Complete
5	Long Bridge Drive Improvements	Arlington County	Planned
6	Long Bridge Rail Improvements & Pedestrian/Bike Bridge	VPRA	Planned
7	Boundary Channel Drive/I-395 Interchange Modification	VDOT	Under Construction
8	Arlington National Cemetery (ANC) Southern Expansion	ANC	Under Construction
9	Army Navy Drive Complete Street Project	Arlington County	Under Construction
10	Arlington Memorial Trail	Arlington County	Planned



Figure 2-7 Key External Projects

2.2 LAND USE

Campus land use designations have generally remained stable since the 2016 update.

The 2016 update reduced seven existing land use categories to six proposed categories by eliminating the Construction Laydown (temporary) category. This change is carried forward into this revision. An additional proposed change is to rename the Parking category to Parking/Vehicular Access. This name more accurately reflects the range of land uses that were designated under this category in the 2016 update and currently remain in that category.

The four areas previously designated as Construction Laydown (temporary) in the 2016 update are listed below with their current designations:

1. North Parking Laydown Area

This area is now designated Support and currently operates in a support function for facilities and maintenance projects.

2. HRP Laydown Area

This area is now designated Industrial/Utility. It is currently under-utilized but generally functions as storage for the HRP.

3. Corridor 9-10 Laydown Area

This area is now partially designated Green/Open Space and partially designated Parking/Vehicular Access, reflecting the mix of current uses.

4. Corridor 1-2-3 Laydown Area

This area is now partially designated Green/Open Space and partially designated Parking/Vehicular Access. The Green/Open Space area extends from Corridor 1 to Corridor 2 while the Parking/Vehicular Access extends from Corridor 2 to Corridor 3.

This update carries forward the renamed Parking/Vehicular Access category along with the other five categories from the 2016 update. **Figure 2-8** shows existing land uses at the Pentagon.

1. Administration Land Use

For the purposes of the 2016 Master Plan Update, the Pentagon building was designated as the only administration land use on the campus. This designation remains unchanged and includes all professional and administrative functions that occur in the building. The Pentagon is one of the world's largest office buildings, with approximately 6,500,000 SF. It serves as the headquarters of the U.S. DoD. The building footprint is approximately 30 acres, and the building's Center Courtyard (designated as Green/Open Space) is 5 acres. In total, the Pentagon is nearly 35 acres in size.

The building has five concentric rings and five floors, a partial basement, and a partial mezzanine. Its five façades form the geometric shape of the Pentagon, and each façade has two entrances, numbered 1 through 10, which are as follows:

- » Corridors 1 and 10 – The Metro Entrance Facility is located on this façade and is the most used entrance of the Pentagon. The PTC, which provides bus stops and the Metro entrance, is located just east of the building.
- » Corridors 2 and 3 – The South Parking Lot entrances are located by this façade, with pedestrian access stairs connecting them to the South Parking Lot area.
- » Corridors 4 and 5 – The 9/11 Memorial site and the delivery truck inspection station are located at the southern end of this façade.
- » Corridors 6 and 7 – The David O. Cooke Terrace, RDF, Pentagon Athletic Center (PAC), Mall Entrance, and Helipad are located on this façade.
- » Corridors 8 and 9 – The River Entrance and River Terrace are located on this façade.



Pentagon Building - Administration Land Use



HRP - Industrial/Utility Land Use

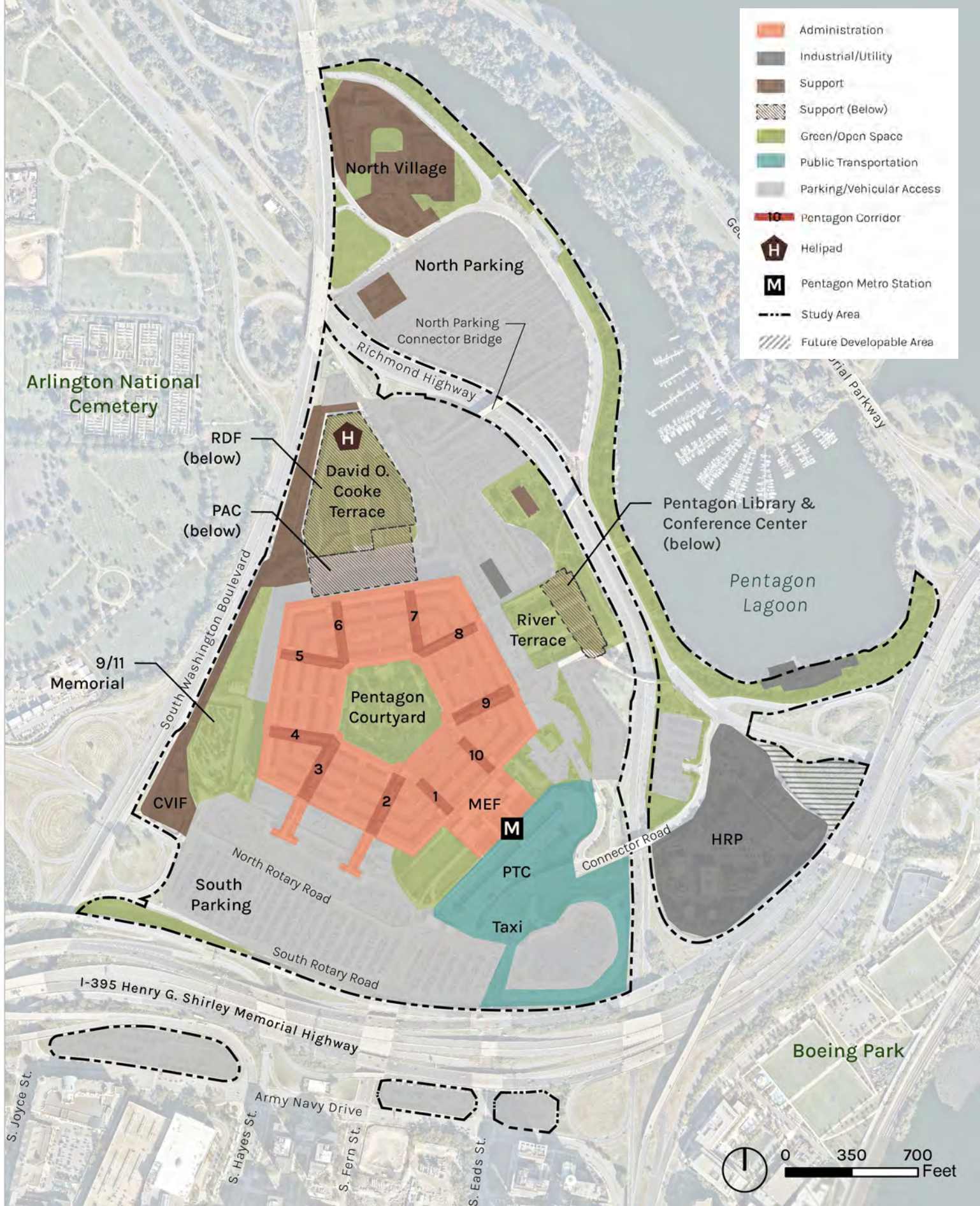


Figure 2-8 Pentagon Land Use

2. Industrial/Utility Land Use

These areas generally provide utility services to the Pentagon campus. The first area is the HRP, which includes an incinerator. The HRP is located on the southeastern edge of the campus, with access from Connector Road and Long Bridge Drive. The second area is next to the Pentagon Lagoon and is an Industrial/Utility Land Use.

Since the 2016 update, one area was added to the Industrial/Utility category to include a new building systems/utility facility adjacent to the River Terrace in the North Secure Parking Lot. Additionally, the HRP Industrial/Utility area was increased by converting the previously designated laydown area to Industrial/Utility to reflect its current character and use.

3. Support Land Use

Support Land Use areas include auxiliary functions that support the Pentagon mission and are located on the campus grounds. The North Village, the area below the River Terrace, and the commercial vehicle inspection facility (CVIF) (formerly designated as the secure access lane [SAL]) and truck delivery entrance at the RDF, located on the western edge of the campus, are the three functions categorized as Support Land Use.

While the areas designated as Support Land Use have not changed since the 2016 update, one of these areas, the North Village, has seen significant new facilities construction and a change in the specific support functions present. Previously, the North Village's primary tenants were WHS/Facilities Services Directorate (FSD)/Engineering and Construction Management (ECM) as well as WHS/FSD/Acquisition Directorate (AD). With the construction of the Pentagon Support Operations Center (PSOC) (see Facilities [Section 3.5](#)), PFPA is now a significant presence in the North Village.

4. Green/Open Space Land Use

Green or open space areas take up approximately 79 acres on the Pentagon campus. In addition to landscaped areas adjacent to the Pentagon building and scattered across campus, the major green areas include the following:

- » Center Courtyard
- » 9/11 Memorial
- » David O. Cooke Terrace (RDF Roof)
- » River Terrace
- » Green space along Boundary Channel Drive around the Pentagon Lagoon

Green/Open Space Land Use areas on the campus have grown since the 2016 update. Some areas adjacent to the VA 27/VA 244/I-395 Interchange have been impacted by realignment, shifting some areas to a transportation use. Two small areas formally designated as laydown space were added to the Green/Open Space category.

5. Public Transportation Land Use

The PTC is a major intermodal transit node located next to the MEF by Corridors 1 and 10. The PTC includes the WMATA metro system area and the public bus service area for Metrobus and several regional bus services. The Pentagon Metro Station, located below grade, provides access to both the Blue and Yellow lines.

While areas dedicated to Public Transportation remain in place since the 2016 update, there have been some changes to the circulation pattern and facilities in the eastern portion of the South Parking area. These changes are described in detail in [Section 2.5](#).

6. Parking/Vehicular Access Land Use

Parking represents the largest land use on the Pentagon campus. Only surface parking is available on the campus, with approximately 8,011 parking spaces located on lots throughout the site. Each lot is permit-controlled. The current parking represents a reduction from the 8,494 accounted for in the 2016 update.



Center Courtyard - Green/Open Space Land Use



North Village - Support Land Use



Pentagon Transit Center - Public Transportation Land Use



Parking Land Use

2.3 NATURAL FEATURES

The Pentagon campus has been entirely developed and retains only a few natural areas. Changes to the campus's natural features in recent years have been limited to protection/restoration work along the southern edge of the Pentagon Lagoon. The campus terrain is mostly flat, with no major slopes or significant natural grade changes. The built environment and landscaped and vegetated areas all impact the surrounding ecology. Buildings, traffic, roadways, and parking lots on the property contribute to stormwater runoff and urban heat-island effects. Surface water runoff from the Pentagon campus directly affects water quality in the Potomac River and Chesapeake Bay Watershed. Lack of consolidated open space and mature vegetation provides minimum amelioration of heat-island effect and little in the way of amenities for Pentagon campus visitors and staff.

The Pentagon campus is located within the Atlantic Coastal Plain geologic province. The geological formations of the campus include the Cretaceous sedimentary units of the Potomac Formation, common to the Washington Metropolitan area. The soils in the Pentagon campus area are mostly alluvial fill, with some alluvium and lowland terrace deposits (see [Figure 2-9](#)). Much of the original soil on the site has been disturbed and covered with fill material during construction of the Pentagon.

The entire Pentagon campus is within a resource management area (RMA), and the 100-foot border along Boundary Channel and the Pentagon Lagoon is a resource protection area (RPA) per the Virginia Chesapeake Bay Preservation Act and as designated by the Chesapeake Bay Preservation Ordinance of Arlington County (Arlington County Code, Chapter 61). The RPA is outlined in [Figure 2-9](#). Because of these land designations, the disturbance of 2,500 SF or more on the Pentagon campus triggers land development requirements.

[Figure 2-9](#) also shows the sparse distribution of significant vegetation across the Pentagon campus, with the largest area planted along Boundary Channel/Pentagon Lagoon. Much of the vegetation on the site consists of grass, groundcovers, and trees planted during the original development of the Pentagon campus and subsequent building projects. Additionally, a riparian buffer restoration project restored over 10 acres of habitat along the Boundary Channel shoreline with native vegetation. The Chesapeake Bay Preservation Ordinance of Arlington County requires that all development and redevelopment within the RPA and RMA provide for the planting or retention of trees so that at a maturity of 20 years, the minimum lot coverage of the tree canopy is 10 percent.

There are currently no areas at the Pentagon Site designated as preserved land specifically to maintain a buffer between the civilian community and functions of the military installation, preserve valuable range and training land, provide land for future installation development, and/or conserve irreplaceable environmental habitat or cultural resources.



Vegetation along Boundary Channel



Landscaped Area near the Corridor 1 Entrance



Figure 2-9 Pentagon Natural Features

Note: All areas outside of the RPA are within the RMA.

Due to the extensive fill used to raise the site during construction of the Pentagon in the 1940s, the study area is not subject to serious flooding. Areas next to the Pentagon Lagoon including Boundary Channel Drive are located in the 100-year flood zone; the northern portions of the Pentagon campus are within the 500-year flood zone, which has a 0.2 percent chance of annual flooding.¹³ FEMA is in the process of updating the flood hazard maps for Arlington County and released preliminary flood insurance rate maps (FIRMs) in 2020 and 2022. These preliminary maps reflect changes to the effective FIRMs. In the preliminary FIRMs, the 500-year flood zone extends further south along Richmond Highway and the Pentagon River Terrace; however, these flood zones are still subject to finalization.¹³

Storm surges caused by a combination of high tides, low barometric pressure, and wind from hurricanes and major storms have historically caused more extensive flooding than downstream flows. While this flooding does not result in major impacts at the Pentagon site, the effects of climate change may result in more severe flooding incidents in the future (see [Figure 2-10](#)).

Boundary Channel/Pentagon Lagoon is the only wetland on the site as indicated by national wetland inventory maps of the U.S. Fish and Wildlife Service (USFWS). Some wetland areas are found to the east of the Pentagon campus at the Roaches Run Waterfowl Sanctuary in Arlington County and along the banks of the Potomac River. According to the Arlington County Natural Resources Department wildlife inventory, the wetland at Roaches Run Waterfowl Sanctuary is one of the most ecologically significant parcels remaining in Arlington. It contains rare plants as well as wildlife.

One endangered species (northern long-eared bat) and one candidate species (monarch butterfly) protected by the Endangered Species Act, along with 20 migratory bird species, have the potential to occur at the Pentagon Site.¹⁴ Atlantic sturgeon is also listed as endangered and is protected by the Endangered Species Act and known or likely to occur within a 2-mile radius of the Pentagon site.^{15,16} Four state endangered species (Atlantic sturgeon, little brown bat, tri-colored bat [also proposed to be listed as federally endangered under the Endangered Species Act], and brook floater) and five state threatened species (northern long-eared bat, wood turtle, loggerhead shrike, Appalachian grizzled skipper, and migrant loggerhead shrike) are known or likely to occur within a 2-mile radius of the Pentagon site.^{16,17} However, there is little to no potential for federally or state listed species to be present at the Pentagon site due to inadequate or unavailable habitat. Atlantic sturgeon are expected in the main stem of the Chesapeake Bay but would not be expected in connected water features like the Boundary Channel, though it is possible that juvenile Atlantic sturgeon could move through the area as temporary residents.

Since 2012, WHS has conducted various wildlife surveys to characterize the species and habitats present on the Pentagon site. Based on the surveys, there is little potential for listed species to be present at the Pentagon site. Additionally, impervious surfaces also cut off any greenways that might allow for terrestrial wildlife to migrate between the vegetated areas on the site, which limits the potential number and types of species to be present on site. The western portion of the Boundary Channel has the greatest potential for bird and wildlife habitat at the Pentagon site due to the herbaceous vegetation present along its banks. At low tide, mud flats are exposed along the northern portion of the Boundary Channel and Pentagon Lagoon, which provides foraging areas for shore and wading birds. Additionally, it is not unexpected for bald eagles to be seen hunting along the Potomac River or Boundary Channel.

¹³ FEMA 2022. FEMA's NFHL Viewer Preliminary FIRM Database: 51013C_PRELIMDB. Available at: <https://msc.fema.gov/portal/home>. Accessed on January 24, 2023.

¹⁴ USFWS. 2022a. IPaC Resource List: Pentagon Site. Information for Planning and Consultation Online tool. Environmental Conservation Online System. Available at: <https://ipac.ecosphere.fws.gov>. Accessed on December 15, 2022.

¹⁵ USFWS. 2022b. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Environmental Conservation Online System. Available at: <https://ecos.fws.gov/ecp/species/EOA7>. Accessed on February 3, 2023.

¹⁶ Virginia Department of Game and Inland Fisheries (VDGIF). 2022. VaFWIS Search Report: Pentagon Site. Virginia Fish and Wildlife Information Service. Available at: <https://vafwis.dgif.virginia.gov/fwis/?Title=VaFWIS+Geographic+Search>. Accessed on September 6, 2022.

¹⁷ USFWS. 2022c. Tricolored bat (*Perimyotis subflavus*). Environmental Conservation Online System. Available at: <https://ecos.fws.gov/ecp/species/10515>. Accessed on February 3, 2023.

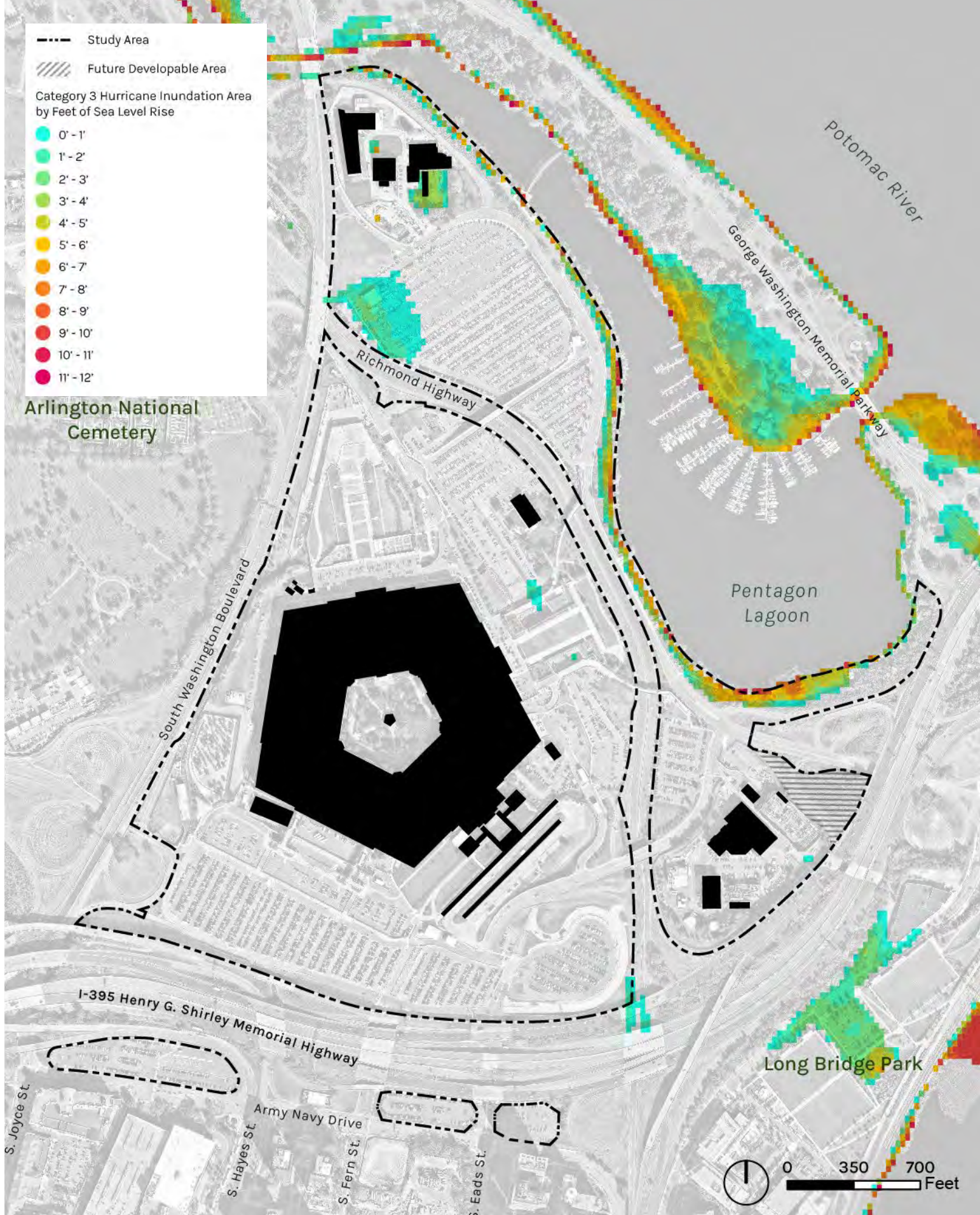


Figure 2-10 Pentagon Inundation Risk - Category 3 Hurricane

REDACTED



REDACTED

Figure 2-11 Pentagon Security Elements

REDACTED

2.5 CIRCULATION

With approximately 26,560 employees commuting to the Pentagon on a daily basis, significant numbers of regional commuters using the PTC, and daily visitors to the Pentagon building and 9/11 Memorial, circulation is a major issue on the Pentagon campus. Recognizing that circulation is a challenge, WHS initiated the transportation management plan (TMP) project in conjunction with the 2016 Master Plan Update to thoroughly analyze transportation issues at the Pentagon campus. The TMP and the 2016 Master Plan Update were prepared concurrently. A more detailed analysis of transportation issues at the Pentagon site can be found in the TMP. It should be noted that current commuter patterns are in flux. Due to the impacts of Covid-19 and evolving work from home (WFH) and related policies with the DoD, current commuting volumes across all modes have decreased. Additional monitoring and analysis will be needed to determine the long-term impacts of the pandemic and WFH policies over the next few years. These changes may significantly impact circulation for all modes and impact parking policies/infrastructure.

Table 2-3 Primary Major Roadways Surrounding the Pentagon

Major Roadways	Direct Access to Pentagon Campus
I-395	Yes
Route 110	Yes
Route 27	Yes
Columbia Pike	Yes
George Washington Parkway	Yes

Table 2-4 Primary Minor Roadways Surrounding the Pentagon

Minor Roadways	Direct Access to Pentagon Campus
Army Navy Drive	No
S. Eads Street	Yes
S. Fern Street	Yes
S. Hayes Street	No
S. Joyce Street	No
Boundary Channel Drive	Yes



View of Pentagon South Parking



Figure 2-12 Regional Roadways around the Pentagon

2.5.1 VEHICULAR CIRCULATION AND PARKING

The Pentagon is located in the vicinity of a number of major regional roadways that provide access to points within Washington, DC, and northern Virginia (see **Figure 2-12**). **Table 2-3** lists the major and minor roadways that provide access to the Pentagon campus. Direct access to the campus is available to and from the I-395 high occupancy vehicle (HOV) lanes. Pentagon employees and visitors who arrive by vehicle must access these roadways.

There are complex patterns of circulation on the Pentagon campus, especially around the South Parking Lot. Vehicular connections between the south portion of the Pentagon site and Arlington County occur via Columbia Pike, Route 27, I-395, South Fern Street, and South Eads Street (**Figure 2-13**). Vehicular circulation on the Pentagon campus is broken into two major zones, centered on the south and north parking lots. The existing vehicle and truck routes on the Pentagon site are illustrated in **Figure 2-14**.

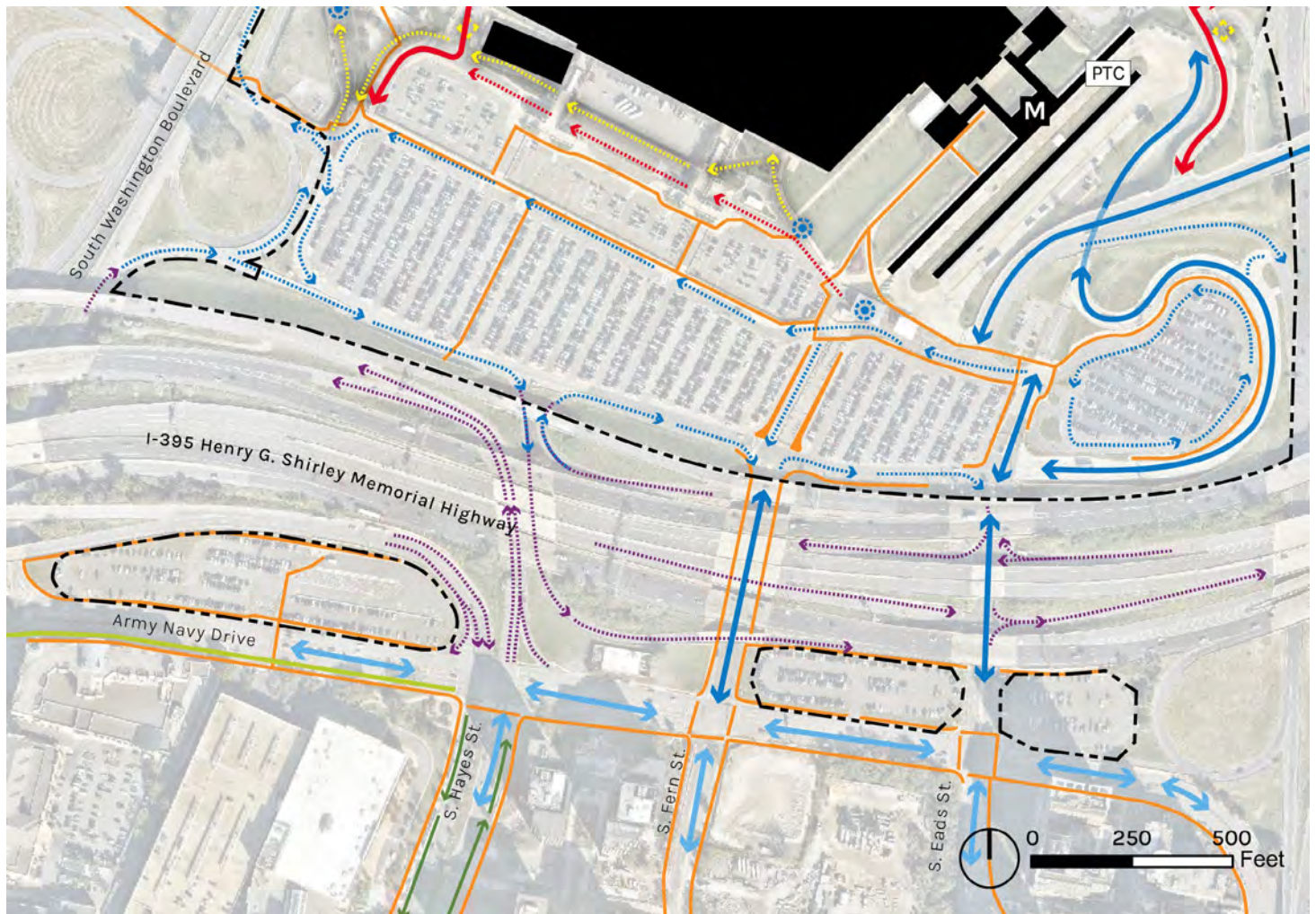
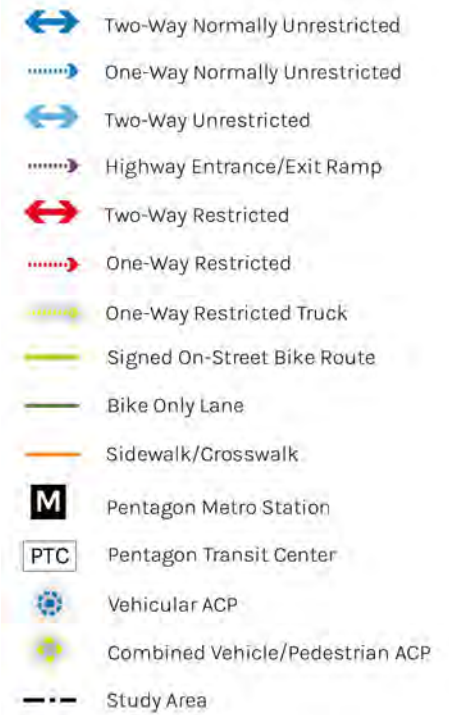


Figure 2-13 Pentagon Vehicular Circulation: I-395 Connectivity Detail

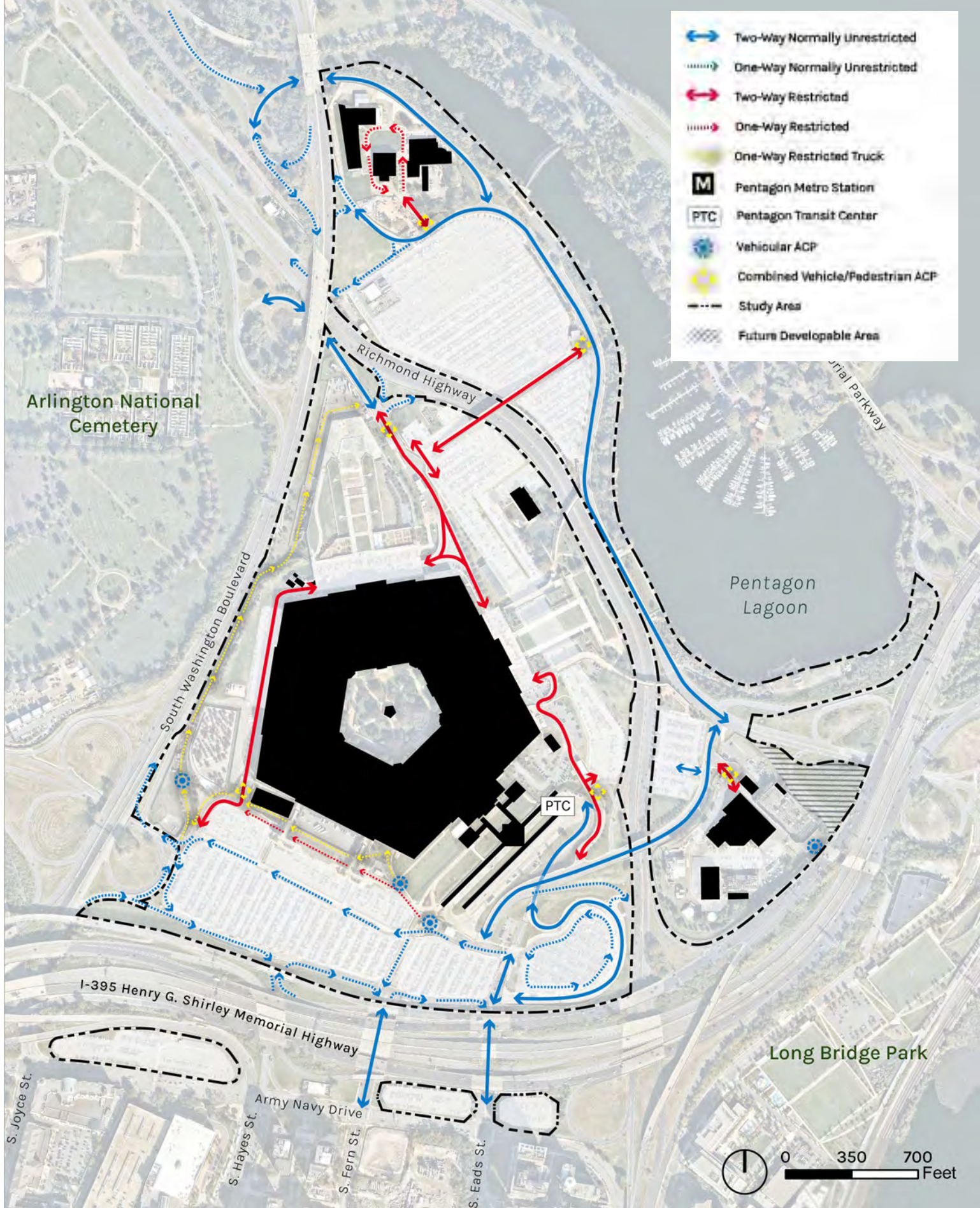


Figure 2-14 Pentagon Vehicular Circulation

PENTAGON SOUTH PARKING AREA

The South Parking Lot area provides access to vehicles, trucks, buses, and pedestrians. Traffic circulation in South Parking has changed since 2015 and has now been designed as a one-way loop system with North Rotary and South Rotary Roads (Figure 2-14). The PTC and the informal rideshare lanes are also located in this area, contributing to the complexity of the circulation patterns. Rideshare areas are not clearly signed, confusing the already complicated circulation patterns. A general lack of informative signage is an issue for visitors and employees alike. The existing circulation pattern has many areas of conflict, raising concerns over the safety of pedestrians and drivers. Intersections that do not operate effectively contribute to traffic congestion within the area. Additional issues include:

- » A lack of vehicle and pedestrian signalization at North Rotary Road and South Fern Street, and at South Rotary Road and South Fern Street, results in traffic congestion and dangerous pedestrian crossings (PFPA currently provides manual traffic control during peak hours).
- » Narrow sidewalks, including at the pedestrian tunnel exit, cause pedestrians to walk in vehicle travel lanes.
- » Narrow crosswalks widths result in inefficient and potentially unsafe pedestrian crossings.
- » Pedestrians exiting the pedestrian tunnel are difficult to see.
- » Inadequate corner radii makes turning movement difficult for large vehicles.
- » Pedestrian, vehicular, and bus conflicts result in “close calls” and erratic driver maneuvers.
- » A lack of signage directing visitors or lost drivers to their destination, as well as nonstandard and unnecessary signs and a lack of lane use control signage.
- » Traffic signal operation is inefficient, pedestrian accommodations are lacking, and pavement markings are faded/missing at the Army Navy intersections.
- » A lack of delineation (pavement markings, roadside hazards).
- » Sidewalk connections are inadequate or missing.
- » Roadway and parking lot pavements are deteriorating.



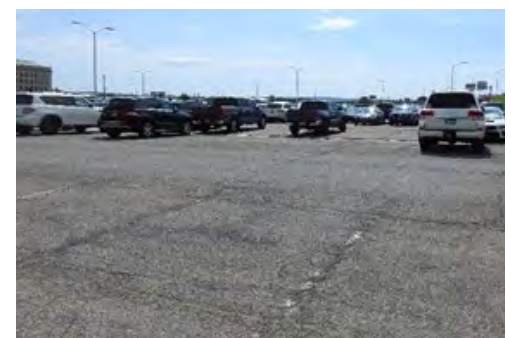
Pentagon South Parking Area



Pedestrian Crossing at South Fern Street



Pedestrian Crossing near Pedestrian Tunnel



Deteriorating Pavement at South Parking Lot

CONNECTOR ROAD AND BOUNDARY CHANNEL DRIVE

Connector Road and Boundary Channel Drive are critical components to complete vehicular and pedestrian traffic circulation within the Pentagon campus. Connector Road extends from Boundary Channel Drive to North Rotary Road and connects traffic to and from Route 110 and Boundary Channel Drive to the South Parking Lot. There is only sidewalk along the north side of the road. There are several safety issues, mainly for pedestrians, including skewed crossing at the access road near the PTC bridge and inadequate sidewalk widths at the PTC and Route 110 bridges.

PTC uses both Connector Road and Boundary Channel Drive for operation and has several circulator stops along Boundary Channel Drive. There are several noncompliant ABA ramps along Boundary Channel Drive sidewalks that may present challenges to persons with disabilities traveling along the path.

In addition to improvements at the bridges, existing pavement along Connector Road is deteriorating and needs pavement rehabilitation to improve rideability.

PENTAGON NORTH PARKING AREA

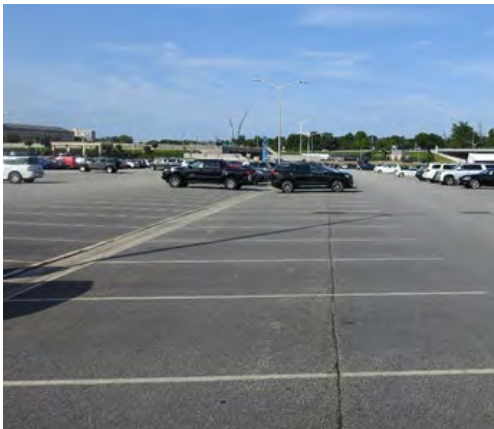
The North Parking Lot area is primarily utilized by employees and some visitors for vehicle parking (see [Figure 2-14](#)). The parked vehicles in the North Parking Lot restrict sight distance for drivers traveling on Boundary Channel Drive as they approach the curve on the northeast corner of the lot. In addition to this issue, there are problems with speeding on this section of the road, which adds to the danger of pedestrians crossing and cars exiting the parking lot.



Deteriorating Pavement along Connector Road



Substandard Sidewalk over Route 110 Bridge



Pentagon North Parking Area

TRANSIT

The PTC is located on the southeastern side of the Pentagon and provides access to the Metrorail (Blue and Yellow lines) and several regional bus systems. The PTC serves as a major intermodal transfer point for the Metrorail and the bus systems. The PTC is highly utilized during peak morning and afternoon travel periods where all of its 24 bus bays accommodate 8 different providers. Based on estimates from the TMP, nearly half of all the PTC trips convey non-Pentagon-related passengers.

The majority of the buses access the PTC via South Rotary Road and South Eads Street. Buses entering and exiting the PTC are separated from passenger vehicles at the intersection of South Rotary Road and South Eads Street and directed into a two-way dedicated bus lane on Rotary Road along the outside perimeter of the eastern end of the South Parking Lot. This deconflicts bus and passenger traffic by eliminating bus traffic on South Eads Street to provide safer pedestrian crossings and passenger vehicle travel along South Eads Street.

RIDESHARE

The Pentagon campus has two rideshare programs. One is a formal program in which Pentagon personnel participate in specific groups for ridesharing in carpools. Participants ride with the same group every day, which allows the driver of the vehicle to use the HOV lanes to and from I-395.

The second is an informal program where a driver will pick up people waiting for a ride in order to qualify to use the HOV lanes. This method of ridesharing is commonly referred to as ‘slugging.’ The Pentagon campus has designated locations or ‘slug’ lanes for picking up riders for the afternoon commute. However, during the morning commute, drivers drop off riders in various locations around the campus. Some of the riders are not Pentagon employees; they are dropped off at the Pentagon campus and use the PTC Metrorail to get to their destinations during the morning commute and use the slug lanes in the afternoon commute to return to their residences.

Some of the issues identified in the previous master plan update have been addressed by improvements on the southeast parking lot. A dedicated rideshare lane and waiting area have been incorporated in the parking lot on the east side of the South Parking Lot (commuter plaza) to accommodate the significant informal carpooling that occurs on the Pentagon campus.

Also, since November 14, 2022, the I-66 Pentagon Pilot Slug Station has been opened at the Hayes Street Parking Lot on Army Navy Drive to provide additional commuting options in preparation for the full opening of the I-66 Express Lanes as part of the VDOT Transform I-66 project (see [Figure 2-15](#)). The Hayes Street Parking Lot is part of the Pentagon campus; as such, drivers and pedestrians are subject to all Pentagon rules and regulations when using the slug station facility.



Pentagon Transit Center



Pentagon Rideshare/Slug Lane



Transit Vehicle Access Lane

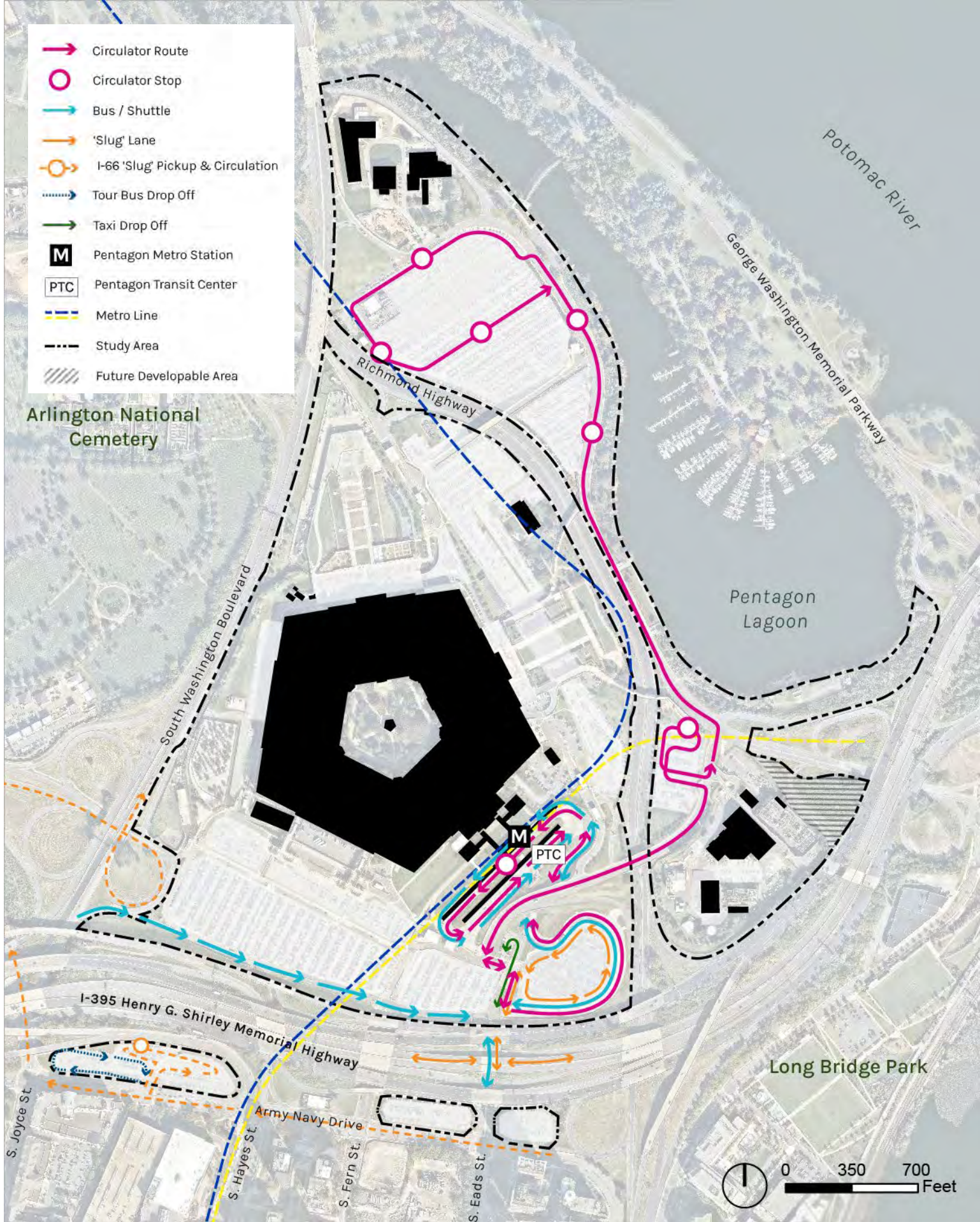


Figure 2-15 Pentagon Transit Circulation

TOUR BUSES

A significant number of tour buses bring visitors to the Pentagon building and 9/11 Memorial on a regular basis. Tour buses are not allowed access to the PTC, so the visitors are loaded/unloaded at the Hayes Street Lot. Visitors then use the pedestrian tunnel just north of the parking lot to get across I-395, and then across the South Parking Lot to get to the Pentagon and 9/11 Memorial. Confusing and inconsistent signage and the lack of ABA-compatible sidewalk along this route makes it difficult for visitors, especially those with disabilities, to reach their destination. Tour bus drop-off points have been relocated from the South Parking Lot to Army Navy Drive.

PARKING

All of the parking areas on the Pentagon campus are surface Lots as shown on [Figure 2-16](#). There are 8,011 total parking spaces on the campus. This represents a reduction from the 8,494 accounted for in the 2016 update. The Southeast Safety Traffic and Parking Improvements project is responsible for most of this reduction. The number of employee parking spaces at the Pentagon is 6,564. This number excludes official vehicle spaces, temporary/visitor spaces and motorcycle parking. With 26,560 employees, the employee parking ratio is one space per four employees (1:4).

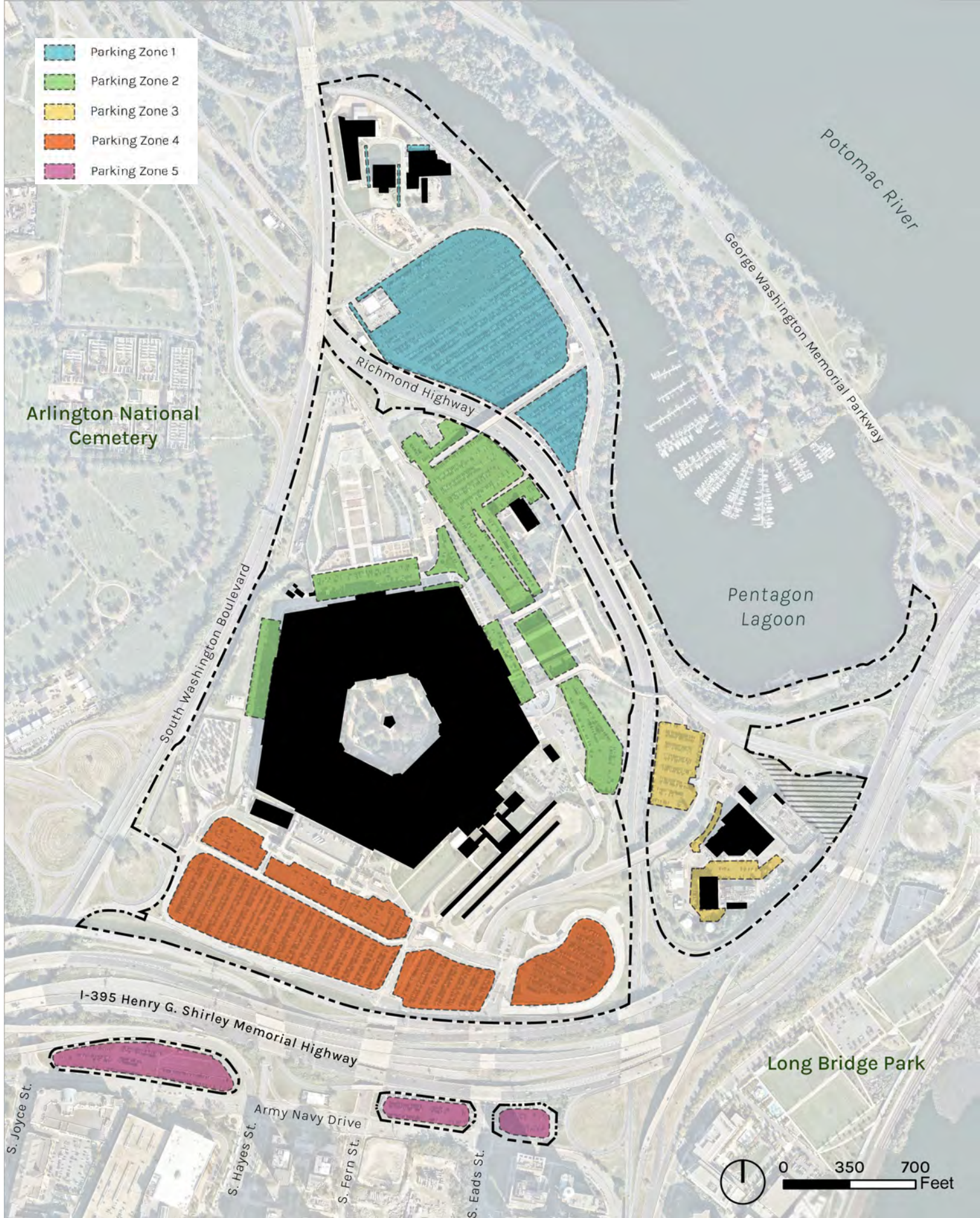


Figure 2-16 Pentagon Parking

2.5.2 PEDESTRIAN AND BICYCLE CIRCULATION

The major pedestrian thoroughfare on the Pentagon site runs between the 9/11 Memorial and the southern side of the Pentagon building (see [Figure 2-17](#)). This route follows the sidewalk along North Rotary Road and turns north towards the building at the North Rotary Road and South Fern Street screening area. The south parking areas feed into this route via connections to the easternmost lot and a dedicated walkway that connects to the pedestrian tunnel running under I-395 to Pentagon City. A significant number of employees enter the building from the Corridor 2 Bridge directly opposite the South Parking Lot area. Pedestrians and bicyclists can move between the 9/11 Memorial and the Air Force Memorial via the existing connection along Columbia Pike.

Pedestrians from the North Parking Connector Bridge can enter the Pentagon building via the Mall Terrace or River Terrace entrances. Only users with access to the Pentagon Athletic Center can use that entrance. The north River Terrace pedestrian bridge connects to the Corridor 8 Pedestrian Access Control Point (PACP). The closest building entrance to the south River Terrace pedestrian bridge is the River Terrace entrance.

Pentagon service members fulfilling their physical training (PT) requirements follow an informal jogging route that starts from the PAC, crosses the North Parking Connector Bridge, heads north along the eastern edge of the North Parking area and links up with two Arlington County multiuse trails. The preferred connection is to the trail running along the eastern edge of Route 27 leading to the Memorial bridge and the National Mall. The other trail connection follows the Boundary Channel Bridge to the LBJ Memorial Grove, heads through the marina parking lot, and joins the Mount Vernon Trail through a new underpass at the Humpback Bridge. Pedestrians have also been observed using an informal footpath from the end of the paved path south of the Humpback Bridge along the Pentagon Lagoon to the shoulder of Boundary Channel Drive near the HRP fence line.

Cyclists utilize both of the Arlington County multiuse trails as well as vehicular roadways. A number of bike racks are situated around the Pentagon campus; the most heavily used are near the Corridor 2 Bridge and at the PAC.

Currently, a number of vehicular-pedestrian conflict areas exist on the Pentagon campus. These include:

- » The intersection of pedestrian and vehicular circulation at the North Rotary and Fern Street screening area.
- » The numerous parking aisle crossings along North Rotary Road in South Parking and along Boundary Channel Drive in North Parking.
- » The inadequate pedestrian crossings along South Rotary Road and across the South Eads Street Connector Road.

In addition to conflict areas, there are also a number of inadequate or missing pedestrian connections. These include:

- » Missing sidewalk segments along the Connector Road.
- » North parking area lacks parking bumpers which lead to cars overhanging the sidewalk and reducing the effective width of the paths.
- » Poor pedestrian environments under I-395, primarily the pedestrian tunnel and the South Fern Street underpass.
- » Less than ideal pedestrian routes through North Parking, limiting the options to either the extreme west or east sides of the lot.
- » Lack of designated bike lanes.

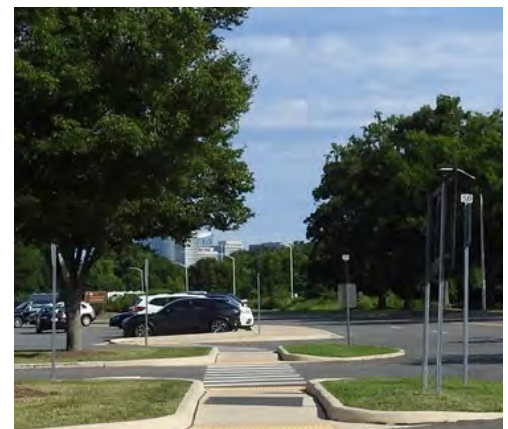
Proposed projects discussed in [Section 3.6](#) address various issues identified in this section. Refer to [Sections 3.6.1](#) through [3.6.9](#).



Numerous Parking Aisle Crossings Create the Potential for Vehicle-Pedestrian Conflicts



Noncompliant ABA Ramps and Crossing



Cars Overhang Pedestrian Paths, Reducing the Effective Width of Sidewalk

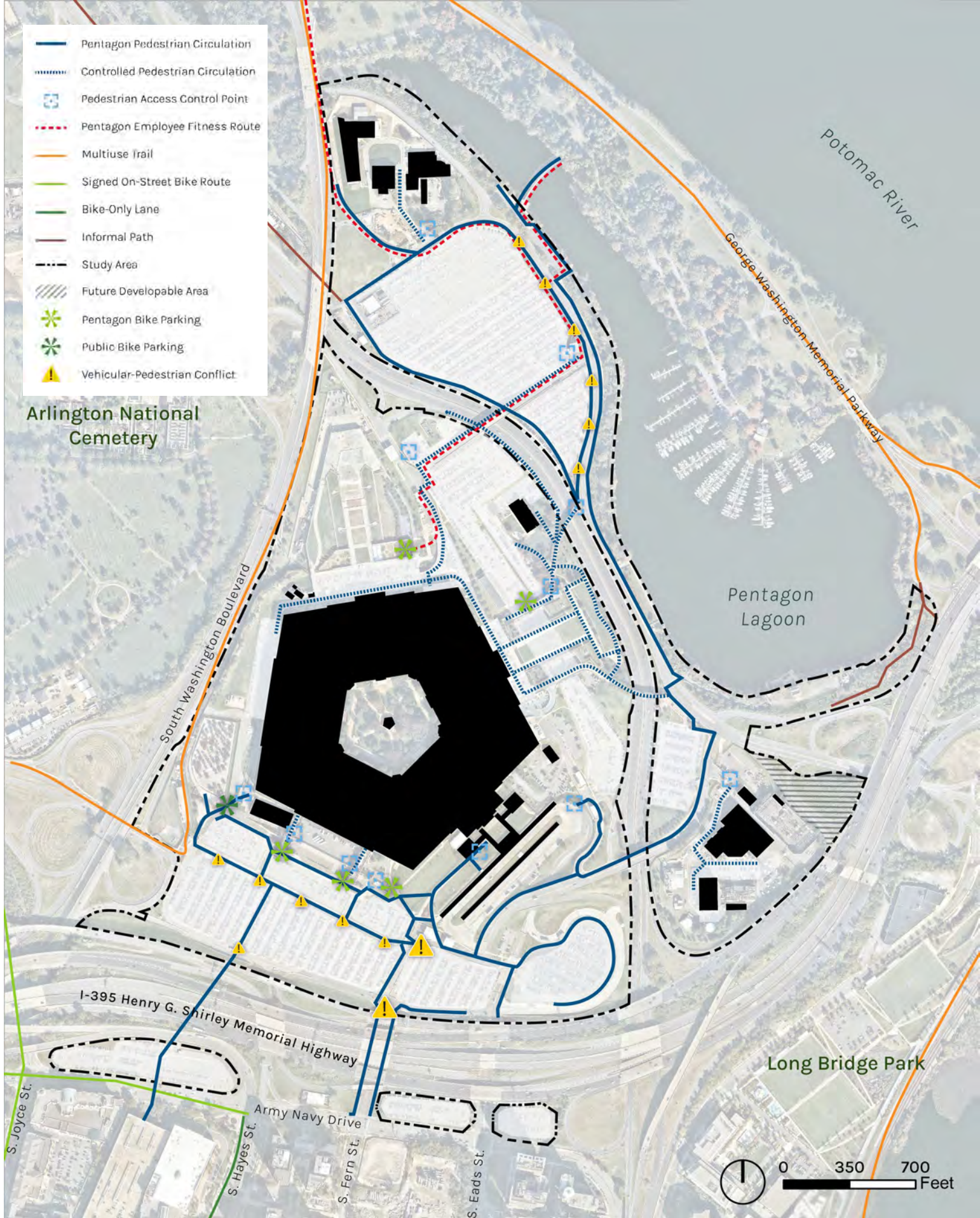


Figure 2-17 Pedestrian and Bicycle Circulation

2.6 HELIPAD

The terrorist attack on the Pentagon on September 11, 2001, forced the relocation of the helipad from its position on the west side of the Pentagon building just east of Route 27. Initially, the helipad was moved to the lower parade ground east of the River Terrace. That location proved unsatisfactory for safety and security reasons, so the helipad was moved to the David O. Cooke Terrace deck, on the north side of the Pentagon, above the RDF, for flight operation and emergency rescue operations (as illustrated in **Figure 2-18**). Due to updated flight regulations, the existing RDF CVIF, and the Route 27 security wall, as well as the 9/11 Memorial, the helipad is prevented from returning to its west side location.

While the helipad is being reconstructed, its location remains the same and functional considerations are unchanged from 2015. The current clear zones for landing and takeoff, based on the current helipad location on the RDF, extend across Route 27 to the west and Route 110 to the east, as illustrated in **Figure 2-18**. The approach-departure areas stretch over Route 27 and adjacent Arlington National Cemetery to the west of the helipad, and over Route 110 and the north parking lot to the east. The configuration of these areas, and relevant regulations, are defined in UFC 3-260-01, Airfield and Heliport Planning and Design, November 17, 2008. According to the regulations, clear zones are not to be encumbered by publicly traveled rights-of-way or any other land use except open agriculture or open space areas. Similarly, land use is controlled within approach-departure areas, although there is more latitude than within clear zones. The current, predominant operation orientation is to take off and land from the east, approaching or departing over the north parking lot. Takeoffs or landing approaches over Arlington National Cemetery are infrequent and limited, so as not to create a disturbance to cemetery operations or visitors.

Flight operations at the helipad are supported by a small air traffic control tower and fire station. The control tower for the helipad is currently located to the west of the RDF, approximately 700 feet southwest of the helipad. The control tower is a structure on the backside of the current emergency fire truck vehicle shed and does not have an optimum view of the helipad. Both the control tower and fire truck shed are temporary structures now beyond their useful operational life. In addition, the existing structures do not have adequate interior space to support the control tower/fire station requirements. A permanent control tower and fire day station are currently under construction along with the reconstruction of the helipad itself.



Helicopter Departing the Pentagon



Figure 2-18 Pentagon Helipad

2.7 UTILITIES

The Pentagon's current utility infrastructure is arranged in numerous underground tunnels and direct line burials, which provide services to the Pentagon building and connect to various private utility trunk lines which cross the site. This system has been built up over the life of the Pentagon and lies below a significant portion of the Pentagon campus land. The utility systems at the Pentagon campus include water, sanitary sewer, storm sewer, natural gas, electrical power, steam and chilled water, telephone, and communication lines. The existing utilities vary in age by type and according to when and what replacements have occurred. The Exterior Utility Master Plan is a set of plans that maps and encapsulates the locations of these various utility lines and utility features across the Pentagon campus. The utility master plan documents have been a supporting effort that has been initiated since the previous Master Plan update.



REDACTED



Sanitary Sewer

Wastewater is pumped from the east sewage lift station to the Arlington County sewage lift station located south of I-395, where it is conveyed to an Arlington County owned and operated wastewater treatment plant.



Storm Sewer

WHS has coverage under a general permit (VAR 040103) for stormwater discharges from small MS4s that applies to all Pentagon property. Generally, stormwater runoff from impervious surfaces, and on occasion from saturated soils under heavy storm conditions, occurs as overland sheet flow that gravity drains to stormwater catchment areas. Drop inlets located within the stormwater catchment areas connect to a network of storm sewer piping that discharges untreated stormwater runoff into Boundary Channel and the Pentagon Lagoon via five discharge points. Additionally, multiple stormwater BMPs (e.g., bioretention areas, vegetated roofs, Filterra®) within catchment areas collect and treat stormwater runoff.



Steam and Chilled Water

The Pentagon receives steam and chilled water for heating and cooling purposes from the HRP, located in the southeastern corner of the Pentagon campus. Steam and condensate return and chilled water supply and return piping connect the plant with the Pentagon via a combination of direct burial pipe and pipe installed in an underground tunnel. Condenser supply water is pumped from the Pentagon Lagoon to the HRP and is returned to the Roaches Run Waterfowl Sanctuary in a network of underground piping.



Natural Gas

The Pentagon's natural gas is supplied by Washington Gas Company. A service line from the 12-inch Washington Gas main connects to the HRP, which uses natural gas as the primary fuel to produce saturated steam.



Fuel Oil

The Pentagon maintains a supply of fuel oil for backup generators, as well as the boilers and incinerator plant during natural gas curtailment. Two 300,000-gallon tanks are located at the HRP for fuel oil storage. The Pentagon periodically replenishes fuel oil supplies in storage tanks to ensure sufficient energy for outage and testing events. Fuel oil is consumed periodically, and replaces natural gas consumption by boilers and the incinerator plant. Boiler and incinerator plant usage far outweighs usage from the generators. (Source: Washington Headquarters Services Installation Energy Plan – Pentagon Campus.)



Electrical Power

The Pentagon receives electrical power from Dominion Virginia Power Company. Underground electric lines run through the Pentagon campus area. Major utility power lines run under the North Parking lot.



Telephone and Communications

The Pentagon has a complex telephone and communications system.

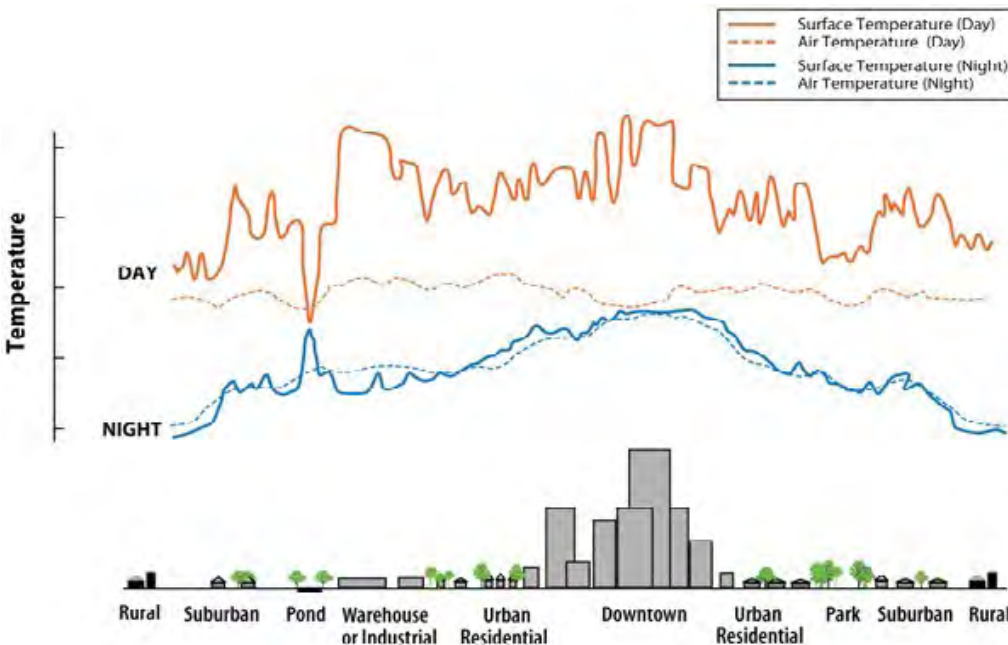
2.8 ENVIRONMENT AND SUSTAINABILITY

As the Pentagon campus began to develop in the 1940s, buildings, roads, and other infrastructure replaced previous developments. Surfaces that were once permeable were replaced with impermeable surfaces. The Pentagon site has 79 acres of green space, but often these areas are not sufficiently vegetated, nor are they vegetated with native or regionally appropriate plants. The Pentagon site has a significant amount of impervious surface area, primarily from paved parking lots. In the previous master plan update, the replacement of some impervious area to permeable pavement was considered as a potential stormwater management solution. However, since permeable pavement is not ideal for heavy traffic areas due to low load-bearing capacity and required maintenance to maintain porosity, this remediation method is no longer being considered for incorporation into future development/redevelopment at the Pentagon site.

HEAT ISLANDS

The 2016 Master Plan Update identified heat islands as a significant environmental issue. Heat islands at the Pentagon site are produced by large amounts of impervious surface area in the parking lots, sidewalks, Pentagon roof, and other built structures around the campus. The term ‘heat island’ describes the phenomenon whereby urban regions experience warmer temperatures than their rural surroundings due to trapped heat within hard surfaces. Heat islands cause negative effects by increasing summertime peak-energy demand, air-conditioning costs, air pollution and greenhouse gas (GHG) emissions, heat-related illness, and poor water quality. On a hot, sunny, summer day, the sun can heat dry, exposed, urban surfaces, such as roofs and pavement, to temperatures 50–90° Fahrenheit (F)/27–50° Celsius (C) hotter than the air, while shaded or moist surfaces, often in more rural surroundings, remain close to actual air temperatures (see [Figure 2-19](#)).

Strategies for reducing the negative effects of heat islands range from planting trees, increasing the amount of native vegetation, and implementing green and/or cool roofs. Increased tree and vegetative cover can help to lower surface and air temperatures by providing shade and through evapotranspiration. Trees and vegetation that provide shade to directly adjacent buildings can also help to reduce air-conditioning energy demands. In addition, increased trees and vegetation can help remove air pollutants, store and sequester carbon dioxide, and absorb stormwater runoff.



Surface and atmospheric temperatures vary over different land use areas. Surface temperatures vary more than air temperatures during the day, but they both are fairly similar at night. The dip and spike in surface temperatures over the pond show how water maintains a fairly constant temperature day and night, due to its high heat capacity.

Note: The temperatures displayed do not represent absolute temperature values or any one particular measured heat island. Temperatures will fluctuate based on factors such as seasons, weather conditions, sun intensity, and groundcover.

Figure 2-19 Surface Temperature vs. Air Temperature

Source: U.S. Environmental Protection Agency

Green roofs and cool roofs help reduce temperatures of roof surfaces and the surrounding air. Green roofs absorb heat and act as insulators for buildings, which can help reduce the amount of energy needed to heat and cool the building. Green roofs also create additional vegetative surface and provide benefits associated with increased vegetation. Cool roofs use reflective surfaces to help reflect sunlight and heat away from the building, which can reduce roof temperatures and the amount of heat that transfers from the roof to the building, lowering building energy use during hot summer weather. These strategies are incorporated into the master plan projects in [Chapter 3](#).

STORMWATER

In addition to the heat island effect, the large amount of impervious surface affects stormwater management on the Pentagon campus. Stormwater is rainwater and melted snow that runs off streets, sidewalks, and other sites. Stormwater on natural or undeveloped land gradually infiltrates into the soil, replenishing groundwater supplies and slowly discharging excess runoff to local creeks. In developed areas such as the Pentagon site, however, impervious surfaces such as pavement and roofs prevent stormwater from naturally soaking into the ground. Instead, the large amount of impervious surface on the Pentagon campus requires a complex network of surface drainage structures and underground stormwater lines to discharge the stormwater into the Boundary Channel and Pentagon Lagoon. As stormwater runoff flows over pavement, it picks up pollutants like oils, sediment, trash, and chemicals that are left on streets and walkways. Eventually, all those pollutants make their way down through the watersheds to the Potomac River and the Chesapeake Bay.

The discharge of stormwater pollutants at the Pentagon are regulated by the Clean Water Act. The Pentagon must comply with Chesapeake Bay TMDL requirements for total phosphorus, total nitrogen, and total suspended solids.

The primary method to control stormwater discharges is the use of water quality BMPs to filter stormwater before it enters nearby waterways. Because drainage conditions vary within the Pentagon campus, different BMPs will be appropriate at different parts of the campus.

Examples of BMP measures that have been found to be viable at the Pentagon include:

- » Bioretention
- » Vegetated Swales
- » Stormwater Planters
- » Native Landscaping
- » Tree Box Filters
- » Vegetated Riparian Buffer
- » Vegetated Roofs

Detailed descriptions of these BMP measures are described in [Section 3.7.1](#).



PAC Entrance Existing Bioretention Area



North Rotary and Fern VACP Existing Bioretention Area



Corridor 5 VACP Existing Bioretention Area

STORMWATER REQUIREMENTS

Stormwater requirements can vary depending on the requirements of federal, state, and local laws. These requirements and regulations, most of which were identified in the 2016 Master Plan Update, include:

- » **Clean Water Act**
Ensures that waterways and water sources are protected from pollutants carried by stormwater runoff. As land is renovated and developed on the Pentagon campus, adherence to the state and federal regulations governing stormwater management will be required.
- » **Energy Independence and Security Act (EISA) Section 438**
Requires that federal projects with a footprint of 5,000 SF or greater maintain or restore the predevelopment hydrology of the property to the maximum extent technically feasible.
- » **UFC 3-210-10, Low Impact Development**
Directs DoD components to implement Section 438 using BMP techniques. To accomplish this objective, each individual project must capture, treat, and recycle/infiltrate/evapotranspire the design storm runoff. The design storm can be calculated by either historically comparing the site before modern development (woods in good condition in most cases) to the proposed development or using a calculated 95th percentile storm (1.7-inch storm for Washington, DC). Vegetative roofs, infiltration technologies in type A/B soils, and rainwater harvesting are several of the key technologies for fully achieving the stated EISA Section 438 requirements.
- » **Chesapeake Bay Preservation Act**
The RPA is outlined in **Figure 2-15** per the Chesapeake Bay Preservation Ordinance of Arlington County. Construction activities that disturb at least 2,500 square feet and less than 1 acre of land require a Land Disturbing Activity (LDA) permit through the Arlington County Department of Environmental Services. Construction activities that disturb 1 acre or more of land require coverage under a Construction General Permit (CGP) through DEQ. Construction activities that disturb one or more acres of land do not require an Arlington County LDA permit. A development plan with a stormwater management plan and erosion and sediment control plan is required to meet permit requirements. Compliance with this and all other Arlington County and VDEQ stormwater regulations is required. The DoD has department-level targets to reduce total nitrogen, total phosphorus, and total suspended solids from its land within the Chesapeake Bay Watershed. The Pentagon is required to annually report on its pollutant removal progress via data calls issued by the DoD's Chesapeake Bay Action Team. Generally, for any land disturbing activities exceeding 2,500 SF at the Mark Center, the Chesapeake Bay Preservation Ordinance of the City of Alexandria, Article XIII, states that the entire water quality volume from the site shall be treated, and that the minimum design criteria and statewide standards for stormwater management (per 9VAC25-870-63) shall be applied for the discharge of stormwater pollutants from any regulated activities.



Clean Water Act 50th Anniversary



Chesapeake Bay Preservation Act



BMP Techniques on the Pentagon Campus

- » **Virginia Stormwater Management Act (VSMA)**
 New development and redevelopment on the Pentagon campus is subject to the requirements in this act, which focuses on removal of stormwater pollutant particulates. Land disturbing activities that obtain permit coverage for construction must meet the water quality requirements in 9VAC25-870-63. To meet the quality requirements, the VDEQ has directed that each project be evaluated using the Virginia Runoff Reduction Method (VRRM). Two elements must be evaluated:
 - » Land conversion of existing impervious area to pervious area must be considered first on all projects
 - » Installation of one or more VDEQ-approved BMPs to collect and treat site stormwater runoff.
- » **Virginia Stormwater Management Program (VSMP)**
 As part of this program, the VDEQ administers MS4 permits for urban stormwater discharges. The Pentagon's current MS4 permit (effective January 31, 2019) requires that WHS reduce pollutant loads for total phosphorus, total nitrogen, and total suspended solids by June 30, 2028 to comply with the Chesapeake Bay TMDL. The MS4 permit requires that stormwater pollutant reductions are met whether land is disturbed or not. The permit requires WHS to develop an action plan to identify the required stormwater pollutant reductions for existing land and new development on the Pentagon campus as well as the methods to be implemented to achieve the required reductions. This requires an analysis of the current conditions, required pollutant reductions, and potential future and planned pollutant reductions that can be achieved through installing BMPs as part of construction projects at the campus. Compliance with the Pentagon's MS4 permit is required. WHS has designed projects with green infrastructure BMPs that improve water quality. Once these projects are implemented, WHS will achieve compliance with the Chesapeake Bay TMDL requirements as stipulated in the MS4 permit.
 - » **9VAC25 - Chapters 830, 840, 850, 870, 880, and 890**
 Water quantity (flood protection and channel protection) criteria also apply in accordance with 9VAC25-870-66. Projects within the RPA must comply with more stringent standards.

SUSTAINABILITY

Sustainability is defined as “design, construction, operations, and maintenance practices that meet the needs of the present without compromising the ability of future generations to meet their own needs.” This definition was first put forward by the United Nations World Commission on Environment and Development in 1987, and its content is directly relevant in the development of the Master Plan Revision.

As noted in the 2016 Master Plan Update, new development at the Pentagon campus can significantly contribute to the sustainability of the site through the conservation and wise use of the site’s natural land, water, and energy resources. Accompanying new development with sustainable design and construction methods can offset some of the environmental impacts due to construction and also reduce construction and operating costs for new and existing facilities and landscapes.

The previous master plan update highlighted sustainable development practices encouraged by the federal government among its agencies through a variety of mandates and sustainability initiatives. The DoD last completed the update to their Sustainability Plan, which outlines goals and performance expectations, in 2022. The plan is updated annually (with the updated plan underway) to document and track performance, goal achievement, and new initiatives. The overall goal is to “focus on mission assurance, operational readiness, and cost-effective business practices. DoD’s Sustainability Plan strives to maintain the ability of the Department to operate into the future without decline either in mission or in the natural and man-made systems that support it.” The Pentagon’s sustainability goals and performance targets are informed by executive orders, federal mandates, and sustainability initiatives, including:

- » EO 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability (December 2021)
- » EO 14008, Tackling the Climate Crisis at Home and Abroad (January 2021)
- » Guiding Principles for Sustainable Federal Buildings (December 2020)
- » DoDI 4170.11 Installation Energy Management, Change 1 (March 2016)
- » Energy Act of 2020 (December 2020)
- » EISA (December 2007)
- » Energy Policy Act (EPAAct) (July 2005)
- » 2013 DoD Sustainable Buildings Policy

EO 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability, was issued in December 2021. It directs individual federal agencies, including DoD, to achieve:

- » 100 percent carbon-pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon-pollution-free electricity;
- » 100 percent ZEV acquisition by 2035, including 100 percent zero emission light-duty vehicle acquisition by 2027;
- » Net-zero emissions building portfolio by 2045, including a 50 percent emissions reduction by 2032;
- » 65 percent reduction in scope 1 and 2 GHG emissions by 2030 from 2008 levels;
- » Net-zero emissions from procurement, including use of construction materials with lower-embodied emission; and
- » Climate-resilient infrastructure and operations.



EV Charging Station



PSOC Vegetated Roof



LEED Building Certification

The DoD is preparing a variety of plans, including a carbon pollution-free electricity strategic plan, a zero-emissions fleet strategic plan, and a buildings strategic plan, which will establish interim targets for WHS to contribute to the DoD's achievement of the EO 14057 goals. These plans will drive WHS's efforts related to sustainability, decarbonization, and climate resilience.

EO 14008, Tackling the Climate Crisis at Home and Abroad, was issued in January 2021, with several climate efforts through the federal government. The EO states that "confronting and combating climate change will be an important component of American foreign policy and national security, and domestically, the federal government's resources will be mobilized to deploy a 'govern-wide approach to the climate crisis.'" The White House Office of Domestic Climate Policy and the National Climate Task Force were established by this order. It is the policy that each federal agency will develop and submit to the Task Force a draft action plan regarding steps to increase resilience to the effects of climate change on facilities subject to its jurisdiction. In September 2021, the DoD Climate Adaptation Plan, which outlines these steps, was published. The strategy framework includes lines of effort focusing on climate-informed decision-making, training and equipping a climate-ready force, resilient build and natural infrastructure, supply-chain resilience and innovation, and enhancing adaption and resilience through collaboration.

As part of the effort to achieve DoD's sustainability goals, a new set of building standards, UFC 1-200-02, High Performance and Sustainable Building Requirements, was issued in March 2013 (latest revision date: June 1, 2022) to ensure DoD compliance with all federal requirements on high performance, sustainable buildings. The UFC provides minimum unified requirements and coordinating guidance for planning, designing, constructing, renovating, and maintaining high performance and sustainable facilities. Additionally, it is WHS policy to pursue compliance with Guiding Principles for Sustainable Federal Buildings and achieve Leadership in Energy and Environmental Design (LEED) Silver certification for all eligible construction projects. These requirements will help to reduce ownership costs, improve energy efficiency and water conservation, promote environmental stewardship, and enhance facility and installation performance.

In May 2012, the DoD issued UFC 2-100-01, Installation Master Planning (latest revision date: April 8, 2022), which provides direction and guidance on planning at an installation level that provides a means for sustainable and energy-efficient development that supports mission requirements and addresses climate resilience. Some of the recent changes to the UFC include a DoD Climate Vulnerability Assessment Tool, instituting the DoD Regional Sea Level (DRSL) database for sea level change, and other guidance related to climate considerations in the planning process. The UFC also provides guidance on connected transportation networks that support vehicles, bicycles, and pedestrians; sustainable landscape elements including a requirement to incorporate regularly spaced street trees on roadways (25 to 30 feet on center); BMP and integrated management practices; energy and water conservation; and waste management.

2.9 ENERGY

In the 2016 Master Plan Update, energy related issues and projects were discussed across several areas. Since 2015, energy planning has been driven by the requirements of the DoD memorandum, Installation Energy Plans (March 31, 2016), and the memorandum update, Installation Energy Plans – Energy Resilience and Cybersecurity Update and Expansion of the Requirement to All DoD Installations (May 30, 2018). These requirements resulted in the Washington Headquarters Services Installation Energy Plan – Pentagon Campus (Pentagon IEP) being adopted at the end of FY 2019. The plan is subject to continuous update. A companion IEP for the Mark Center has recently been completed. Future versions of the Pentagon IEP, as well as the Mark Center IEP, will be used to inform the comprehensive update to this master plan 5 years after the completion of this effort.

This revision to the 2016 Master Plan Update seeks to provide additional focus on energy matters by referencing the Pentagon IEP and summarizing key elements in their own sections. This section will cover existing conditions and planned energy projects. The Pentagon IEP informed this section as well as [Section 3.8](#).

REDACTED

2.9.1 REDACTED

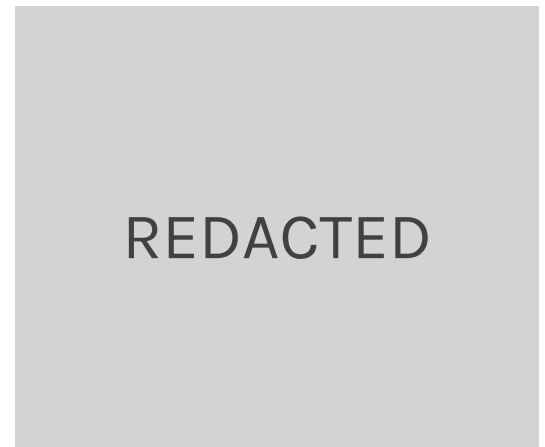


Figure 2-20 FY 2022 Energy Use by Source

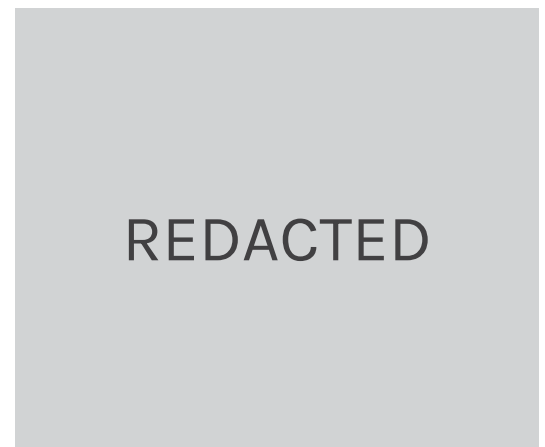


Figure 2-21 FY 2021 Mark Center Energy Use by Source

The IEP objectives and goals established in 2019 embody many of the same principles of master planning at the Pentagon. The objectives established for the IEP include:

- » Meet projected future energy and water demand to achieve mission assurance at the Pentagon campus.
- » Achieve federal, DoD, and WHS identified performance metrics for energy efficiency, resilience, alternative and renewable energy, GHG emissions, water efficiency, alternative fleet fuel use, cybersecurity, and performance contracting.
- » Realize lower operating costs.
- » Address concerns that hinder stakeholder cooperation on energy management.

The IEP identifies five Goal Areas for the Pentagon campus to achieve the above objectives, four of which are energy related. The four energy Goal Areas discussed in this section are:

- » Goal Area 1: Energy Resilience
- » Goal Area 2: Energy Efficiency¹⁸
- » Goal Area 3: Alternative and Renewable Energy
- » Goal Area 4: Transportation Energy¹⁹

It should be noted that the Pentagon IEP also includes goals for water efficiency. These are discussed in [Section 3.8](#). The Pentagon has established Goal Areas 1 and 2 as higher priority areas and has made considerable progress towards achieving both of these Goal Areas. Minimal progress has been made in Goal Area 3. As progress towards Goal Area 4, the Pentagon Campus currently has 17 electric plug-in vehicles as part of its fleet of approximately 333 total vehicles. Additionally, the Mark Center currently has two electric-plug-in vehicles as part of its fleet of approximately 41 vehicles. Tracking is not available for Goal Area 4 because no zero-emission vehicles have yet been purchased as part of the Pentagon Reservation's fleet. An overview of the Goal Areas and current progress is given in [Figure 2-23](#) and [Figure 2-24](#).

GOAL AREA 1: ENERGY RESILIENCE

Three goals were established for energy resilience in the IEP. Existing infrastructure allows the Pentagon to meet Goal 1A. Projects identified in [Section 3.8](#) are planned to achieve Goals 1B and 1C.

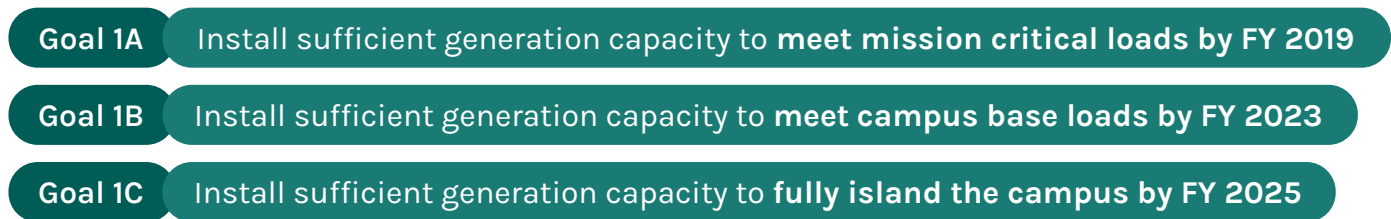


Figure 2-22 Energy Resilience Goals

¹⁸ Pursuant to a memorandum from the Office of the Deputy Assistant Secretary of Defense for Environment and Energy Resilience dated January 14, 2021 regarding utility meter policy: "Within 1 year of publication of this policy, each Component shall establish a policy containing specific criteria for installations to establish metering programs in accordance with the requirements below and any additional Component-specific metering goals. Each Component's metering program should result in the capture of a minimum of 60 percent electricity and natural gas use, with a goal of 85 percent electricity and natural gas use, using advanced meters by September 30, 2024."

¹⁹ The Goal Area 4 (Transportation Energy) should align with the goals of EO 14057. The transportation-related goals of EO 10457 are 100 percent zero-emission vehicle acquisitions by 2035, including 100 percent zero-emission light-duty vehicle acquisitions by 2027.

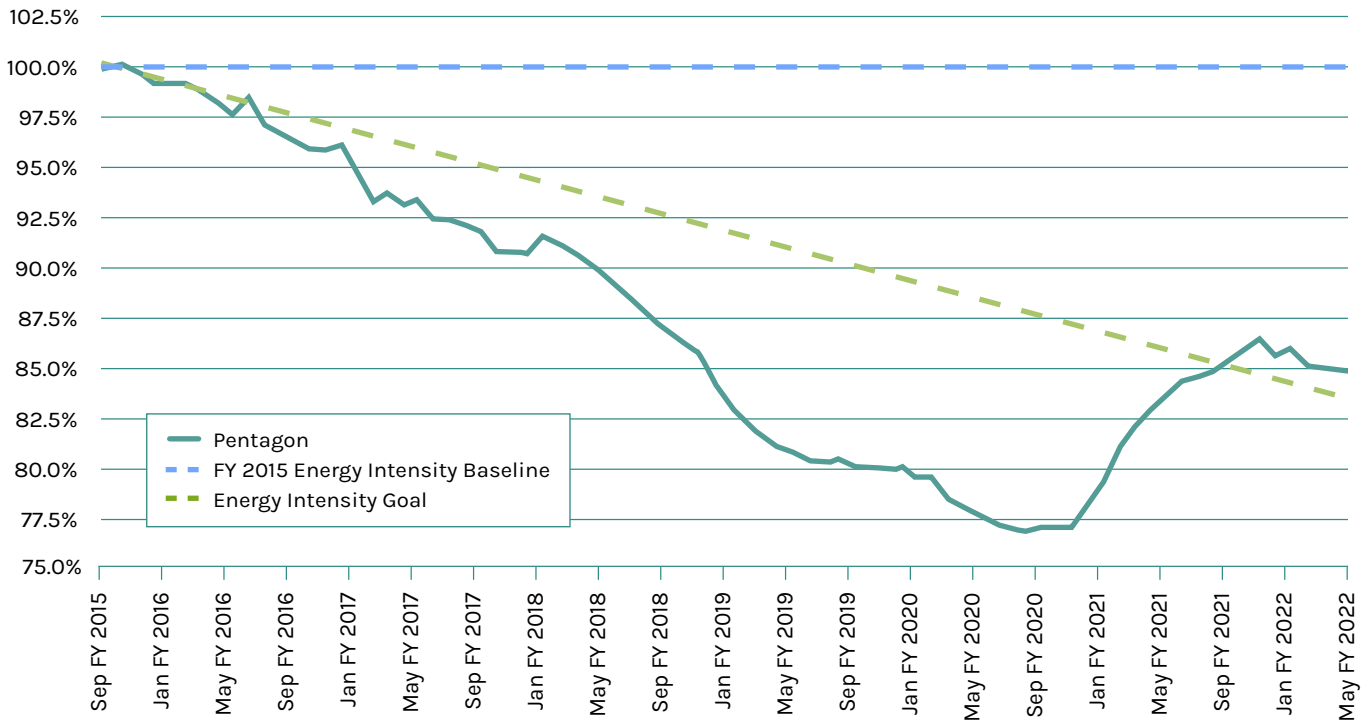


Figure 2-23 Pentagon Rolling 12-Month Energy Intensity Progress from FY 2015 Baseline

PENTAGON ENERGY INTENSITY (FOR AUGUST 2022)

The total energy intensity for the past 12 months based on billing data is 84.9 percent of the baseline period compared to an FY 2022 year-end target of 82.5 percent. Over the last 12 months, there have been 7.5 percent fewer cooling degree days and 12 percent fewer heating degree days than the baseline period. Recent increases in energy intensity are due to Covid-19 related building operation changes.

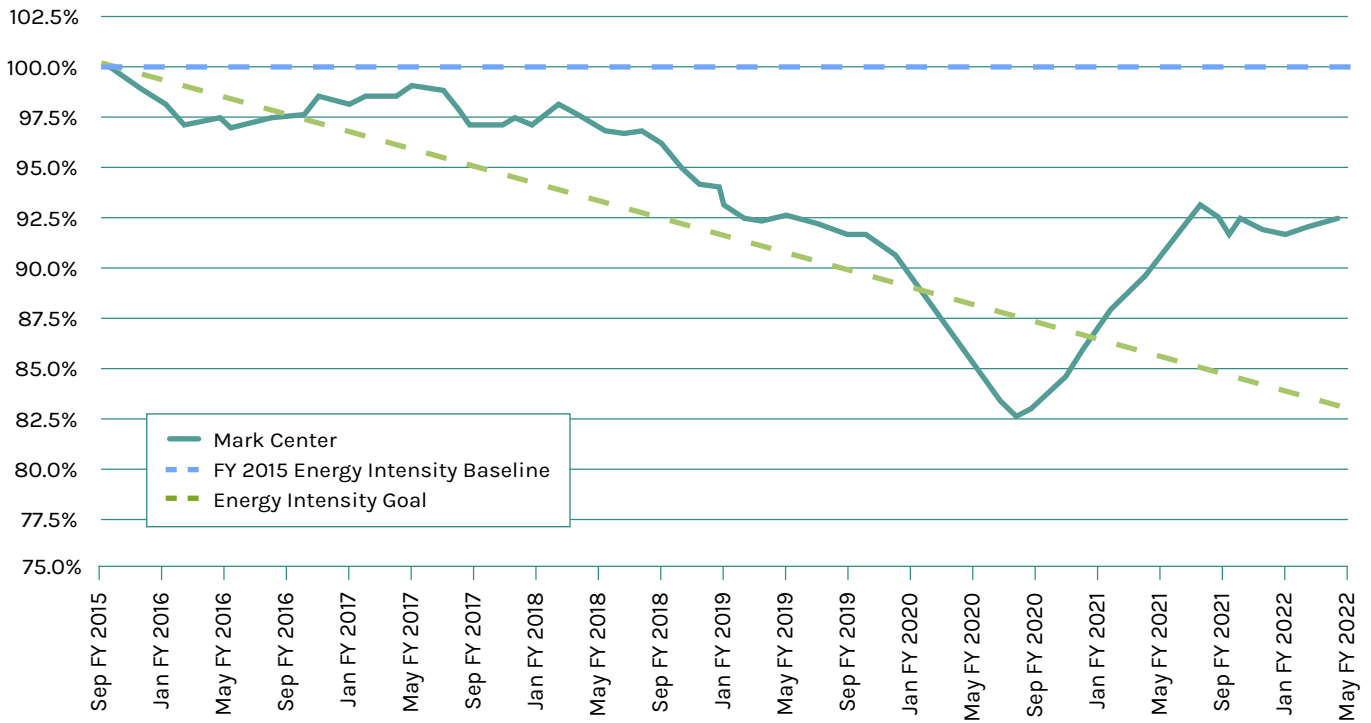


Figure 2-24 Mark Center Rolling 12-Month Energy Intensity Progress from FY 2015 Baseline

MARK CENTER ENERGY INTENSITY (FOR AUGUST 2022)

The total energy intensity for the past 12 months based on billing data is 92.1 percent of the baseline period compared to an FY 2022 year-end target of 82.5 percent. Over the last 12 months, there have been 7.5 percent fewer cooling degree days and 12 percent fewer heating degree days than the baseline period. Recent increases in energy intensity are due to Covid-19 related building operation changes.

GOAL AREA 2: ENERGY EFFICIENCY

The preferred metric for energy efficiency in the IEP is energy use intensity (EUI). EUI improves upon basic energy usage as a metric by being independent of building size. EUI remains a more useful metric over time, even as facilities expand or contract their floor area. Goals for reduction in EUI were established as follows: As of the close of FY 2019, the Pentagon is over 75 percent towards completing Goal 2A and over 40 percent towards completing Goal 2B.

The projects that have enabled this level of success include:

- » **Metering** – In FY 2012, WHS began the Pentagon campus metering initiative to provide WHS with the tools to closely monitor and track the energy use of individual buildings. The first phase of metering was completed in FY 2017. Since then, the 2021 DoD Utilities Meter Policy further identified the metering requirements necessary to measure facility energy use by requiring a minimum of 60 percent and a goal of 85 percent of electricity and natural gas use to be captured with advanced meters where possible. The policy also requires DoD components to install meters on all mission-critical and water-intensive facilities for potable and non-potable water use. As such, WHS has been verifying that a majority of its facilities' energy use is captured by advanced meters and has been replacing any water, electric, or natural gas meters that do not meet this policy.
- » **Recommissioning** – The Pentagon recommissioning program, which began in FY 2010, continues to achieve energy reductions. The Pentagon launched an automated fault detection and diagnostics program in FY 2019 through the Iconics platform, which accelerates the ability for maintenance staff to identify and repair issues.
- » **Hot Water Reset** – Through the recommissioning program, the Pentagon implemented a hot water reset strategy to reduce the heating system's energy usage during summer months.
- » **Lighting Upgrades** – WHS completed designs of lighting enhancement projects (LEPs) to reduce lighting power densities, improve lighting controls, reduce maintenance, and improve lighting quality throughout the Pentagon campus. WHS awarded a construction contract to install light-emitting diode (LED) lights in selected spaces, with lighting control capability where cost effective, through FY 2021.
- » **Data Centers** – WHS used computational fluid dynamics software to model all WHS data centers at the Pentagon. This project identified low-cost improvements and energy conservation measures (ECMs) to improve data center energy efficiency. WHS completed an Energy Resilience and Conservation Investment Program (ERCIP)-funded contract to improve air management practices by incorporating hot and cold aisles, relocating perforated floor tiles to cold aisles, relocating ceiling plenum return tiles above hot aisles and computer room air conditioning (CRAC) units, adding doors at the ends of cold aisles, and installing blanking panels in the server racks in FY 2019. In FY 2017, WHS awarded an Energy Conservation Investment Program project to upgrade, replace, and add new CRAC units and to add additional control capabilities.
- » **Utility Energy Services Contract (UESC)** – In FY 2016, WHS initiated a UESC that will finance many of the energy resilience and energy efficiency projects as described in [Section 3.8](#), including but not limited to chiller replacements, lighting improvements, water-efficiency retrofits, and building envelope improvements. Projects identified in [Section 3.8](#) are planned to achieve Goals 2A and 2B.

Goal 2A Reduce EUI 25% by FY 2025 (FY 2015 baseline)

Goal 2B Reduce EUI 45% by FY 2035 (FY 2015 baseline)

Figure 2-25 Energy Efficiency Goals

GOAL AREA 3: ALTERNATIVE AND RENEWABLE ENERGY

Goal Area 3 has proved challenging to achieve at the Pentagon, with less than 1 percent of the goals achieved. Many renewable energy technologies require large land areas that are not available at the Pentagon campus, given general site size limitations as well as historic preservation, security, and urban constraints. Additionally, current technologies do not make renewable sources price-competitive with electric rates. Due to these implementation constraints and cost issues, Goal Area 3 has been given a lower priority than Goal Areas 1 and 2.

WHS has investigated other potential means of acquiring renewable energy for the Pentagon campus, including leveraging power purchase agreements, energy service agreements, or enhanced use leases. To date, these sources have not been able to meet the Pentagon's integrated requirements for cost and resilience. Renewable energy markets and technologies continue to evolve at a rapid pace. WHS is continuously monitoring and analyzing these changes to identify cost effective and resilient solutions.

Further analysis will be included in the updated Pentagon IEP.²⁰

Goal 3A Produce/procure at least 7.5% of electric energy from renewable energy by FY 2020

Goal 3B Produce/procure at least 25% of facility energy from renewable sources by FY 2025

Figure 2-26 Alternative and Renewable Energy Goals

²⁰ EO 14057 defined a goal of 100 percent carbon-pollution free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon pollution-free electricity. Additionally, EO 14057 sets forth a goal of a net-zero emissions building portfolio by 2045, including a 50 percent emissions reduction by 2032. These goals have been incorporated into current WHS policy and will be reflected in the updated IEP.

GOAL AREA 4: TRANSPORTATION ENERGY

The discussion above has focused on reducing various types of facility energy usage. Transportation is generally the second largest user of energy. For the Pentagon, fleet vehicles, shuttles, and service vehicles make up the majority of vehicle energy use. These vehicles have traditionally been powered by petroleum-based fuels. The Pentagon goals for transportation energy pertain primarily to fuel use in the Pentagon fleet. WHS is currently pursuing efforts such as installing solar electric vehicle (EV) charging stations, grid connected posts, and wall chargers to further support the transition to a ZEV fleet. **Section 3.8** contains more information on these efforts. This Goal Area is considered a lower priority than Goal Areas 1 and 2.

Transportation fuel use information was not included in the Pentagon IEP. Further analysis will be included in the updated Pentagon IEP.²¹

Goal 4A Reduce petroleum consumption by 20% (FY 2005 baseline)

Goal 4B Transportation fuel consumption include 10% alternative fuels (FY 2005 baseline)

Figure 2-27 Transportation Energy Goals

²¹ EO 14057 defined a goal of 100 percent zero emission vehicle acquisitions by 2035, including 100 percent zero-emission light-duty vehicle acquisitions by 2027. This goal has been incorporated into current WHS policy and will be reflected in the updated IEP.

2.10 THE MARK CENTER

The Mark Center Base Realignment and Closure (BRAC) 133 is located approximately 4.5 miles away from the Pentagon is also operated by WHS. The Mark Center site is approximately 16 acres and consists mainly of office space. While it is outside of the monumental core and topographic bowl, it is highly visible from I-395 and Seminary Road.

The Mark Center footprint is located within the 350-acre, mixed-use Mark Center community bounded by Seminary Road to the north, Sanger Avenue to the south, I-395 to the east, and North Beauregard Street to the west. Access to the site is provided via Mark Center Drive, an internal roadway that runs between Seminary Road and North Beauregard Street.

The 2005 BRAC process mandated a move of many DoD offices from leased office space to secure sites that could meet DoD's high antiterrorism security standards. The Mark Center project was a result of recommendation 133 of the BRAC Commission's 2005 report, hence the name BRAC 133. The project was completed in September 2011 and was designed to consolidate more than 6,400 DoD employees, representing approximately 22 tenant organizations, working out of 34 commercially leased office spaces throughout the National Capital Region.

The Mark Center site includes two office towers at 15 stories and 17 stories tall, totaling approximately 1,750,000 SF of office space, two dedicated parking structures with room for more than 3,700 cars and an adjacent pay-to-park parking structure serving other private adjacent uses, a visitor control center, a transportation area for shuttles and buses, a remote inspection facility, and a remote delivery facility.



View of the Mark Center



Figure 2-28 Mark Center Aerial View

2.10.1 INTRODUCTION

Access to the Mark Center site is from Mark Center Drive, which connects to Seminary Road to the northeast and North Beauregard Street to the northwest. The site is surrounded by mixed use development to the north, high-rise office and residential buildings to the northeast, I-395 to the southeast, and the 44-acre Winkler Botanical Preserve to the west. The Winkler Preserve is a privately owned botanical preserve that features natural amenities, walking trails, and educational programs. The preserve was created as a permanent open space area as part of the development agreement for the Mark Center.

The greater Mark Center is a mixed-use community, with residential apartments, a supermarket, childcare facilities, banks, pharmacies, dry cleaners, restaurants, hotel, cafes, and the Winkler Botanical Reserve (a nature preserve with walking trails), which are either at the site or within walking distance. The region has an abundance of shops, restaurants, services (e.g., banks, gas stations and auto repair shops, dry cleaners, and travel agencies) and recreational facilities (e.g., athletic fields, parks, movie theaters, historic sites, and music and theatrical venues).

The Hilton Alexandria at Mark Center is one of the largest hotels and conference facilities in the area. Additional lodging is supported by the Courtyard by Marriott hotel along I-395. The Commonwealth of Virginia Coastal Zone includes all of Fairfax County, the City of Alexandria, and includes the Mark Center. The VDEQ serves as the lead agency for the VCP.

From a transportation perspective, the greater Mark Center is in a mixed-used development area (multifamily, office, and commercial) bounded by King Street (Route 7) on the north, Little River Turnpike (Route 236) on the south, I-395 on the east, and Beauregard Street on the west. The Mark Center is close to both the Holmes Run and Four Mile Run trails, as well as several bike routes.

Adjacent buildings include the 4825 Mark Center Drive building, an eight-story, 214,000 SF building, and the 4850 Mark Center Drive building, which is a ten-story, 270,000 SF building.



View of the Mark Center



Figure 2-29 Mark Center Study Area

Law Enforcement, Fire Protection, and Medical Services

The greater Mark Center is within the jurisdiction of the city of Alexandria Police Department. The closest fire station to the Mark Center is the city of Alexandria Fire Department's Station 206, about 0.5 miles southeast of the site on Seminary Road. The Mark Center site is also within a jurisdiction that is part of the Northern Virginia Emergency Services Mutual Response Agreement. The hospital closest to Mark Center is Inova Alexandria Hospital, which is less than a mile to the southeast on Seminary Road.

Parking

Since parking at the site is restricted to only 3,747 spaces, single-occupancy vehicle (SOV) trips to the site are severely limited (parking ratio of 3,747 spaces for 6,400 people or 0.58 parking space per person). As a result, the goals and objectives of the BRAC 133 TMP are to be achieved primarily through execution of a parking program, implementation of a comprehensive DoD shuttle program, and implementation of an aggressive employee commuter program geared toward promoting other modes of travel (aside from driving alone).

2.10.2 LAND USE

The Mark Center was added to the Pentagon campus as a result of the 2005 round of BRAC. The Mark Center portion of the Pentagon campus occupies 16 acres and is located within a larger commercial development. The site is located in the city of Alexandria, approximately 5 miles southwest of the Pentagon building, along I-395 at Seminary Road. The Mark Center contains three primary land uses:

» **Administration Land Use**

Two office towers provide additional administration space for the DoD. The Mark Center East Tower is a 17-story building and the Mark Center West Tower is a 15-story building.

» **Parking/Vehicular Access**

Three parking structures, related circulation space, service lanes, and a VACP serve the Mark Center.

» **Public Transportation Land Use**

Along Mark Center Avenue, the Mark Center includes a public transit facility with 5 bus bays; a large, sheltered passenger area; and information kiosks.

Sustainable Features

The U.S. Green Building Council (USGBC) certified the \$1.03 billion Washington Headquarters Office Complex at the Mark Center in Alexandria, Virginia, as LEED Gold in 2011, following the vetting of the completed project's sustainability features, making it one of the federal government's largest projects to reach the LEED Gold certification. In 2019, the Mark Center achieved Gold certification under LEED for Existing Buildings: Operation and Maintenance (LEED EBOM), demonstrating its dedication to energy and water efficiency, recycling, green cleaning, alternative transportation, green purchasing, stormwater management, and other areas of sustainability. The Mark Center began the LEED EBOM recertification process in 2022 with the goal of submitting for recertification in 2024.

The buildings were designed to use 30 percent less energy than a traditional building due to a high efficiency central chiller plant using green refrigerants, demand controlled (rather than automatic) ventilation, energy efficient lighting including LED fixtures and occupancy sensors that turn lights off when a room is empty, and a dedicated outdoor air system with energy recovery mechanisms.

The complex was also designed for a 45 percent reduction in water use, which should ultimately lead to an annual reduction of 4.5 million gallons. This was accomplished through low-flow faucets, shower heads, and other plumbing fixtures; use of native, drought resistant plants on the grounds requiring zero irrigation; and stormwater designs that focus on both the quantity and quality of water.

Several visible green elements were also incorporated into the complex, including green roof designs on the visitor center and remote inspection facility to reduce radiant heat, bioswale for natural filtering of stormwater runoff, and green screens with native plants surrounding the north parking garage.

The development was designed with a campus-like atmosphere. Landscape design included streetscape, pedestrian, and buffer areas. Low impact development (LID) components included the use of native plants and a green screen.



Figure 2-30 Mark Center Land Use

2.10.3 NATURAL FEATURES

Noise

Long-term operational noise levels from the Mark Center complex are consistent with typical administrative facilities and remain below local noise ordinance levels. Noise from continued operational and remote inspection facility (RIF) activities are similar to those found at existing warehouses due to traffic and truck deliveries.

Geology and Soils

The topography of the Mark Center site is relatively flat with a moderate to steep slope along the western border and a moderate slope along the southern border, where a ravine for an unnamed tributary to Holmes Run occurs. Forested or grassy conditions on the site generally keep soils stabilized and reduce erosion to nearby tributaries. The soil is characterized as having moderate infiltration rates with some water-holding capacity. No known hydric soils or prime farmlands occur on the Mark Center site.

Surface Water

The Mark Center is in the highly urbanized Cameron Run watershed, which begins in eastern Fairfax County and includes portions of the cities of Falls Church and Alexandria. The site is entirely within the Holmes Run subwatershed of Cameron Run and lies at the headwaters of two unnamed tributaries that are west of and south of the Mark Center site, respectively. The stream to the west is not on the Mark Center BRAC 133 site, and the stream to the south generally follows the border between the Mark Center site and VDOT right of way (ROW) along I-395.

The Mark Center site is on a generally flat plateau, and surface water runoff from the site drains to the west or south into the drainage swales for either of the two small unnamed streams. Both streams flow generally southwest, and each drains into the same constructed stormwater and water quality management pond on the Winkler Botanical Preserve property adjacent to the Mark Center site. This constructed pond is referred to as Winkler Run Pond. The stream along the southern boundary of the site has been channelized for stormwater management and directs runoff from the eastern portion of the Mark Center site and from I-395 through a series of constructed linear ponds (“bays”) with weirs, and ultimately into Winkler Run Pond. The pond design for Winkler Run Pond provides adequate quantity and quality measures. Concrete channelization of this drainage ends above the uppermost bay in the VDOT ROW adjacent to and south of the Mark Center site.

Floodplains and Coastal Zone

The Mark Center site is not within a FEMA-designated 100-year floodplain area (Flood Map Area Number 5155190028E, effective June 16, 2011). Chesapeake Bay RPAs are designated along the previously described, unnamed streams that lie to the west and south of the Mark Center site. The RPA along the stream to the west of the Mark Center site does not extend into the Mark Center BRAC 133 site footprint. About 1.4 acres of the RPA for the stream to the south overlaps the footprint of the Mark Center site (Figure 2-31).

Biological Resources

Vegetation: The site is bordered on the north by a riparian area and on the west by the 44-acre Winkler Botanical Preserve, which is primarily forested with upland and riparian hardwood stands.

Wildlife: The Mark Center site supports natural upland forest habitat and groomed forest. The site previously offered (prior to development) habitat to woodland species; however, no rare, threatened, or endangered plant or animal species have been identified in the immediate vicinity of the site. The Winkler Botanical Preserve to the west of the site contains natural habitat for woodland species.

Sensitive Species: Review of state and federal databases at the time the EA was prepared did not identify any threatened or endangered species in the immediate vicinity of the Mark Center site.

Wetlands: There are no wetlands present on the Mark Center site. The nearest permanent water bodies are two man-made ponds 200 feet and 300 feet to the north of the site, and a constructed stormwater management pond within the Winkler Botanical Preserve 600 feet to the west.

Resource Protection

The Mark Center is located in a resource management area, with the location of the resource protection areas on the Mark Center property defined in the City of Alexandria Zoning Ordinance Article XIII (Environmental Management).

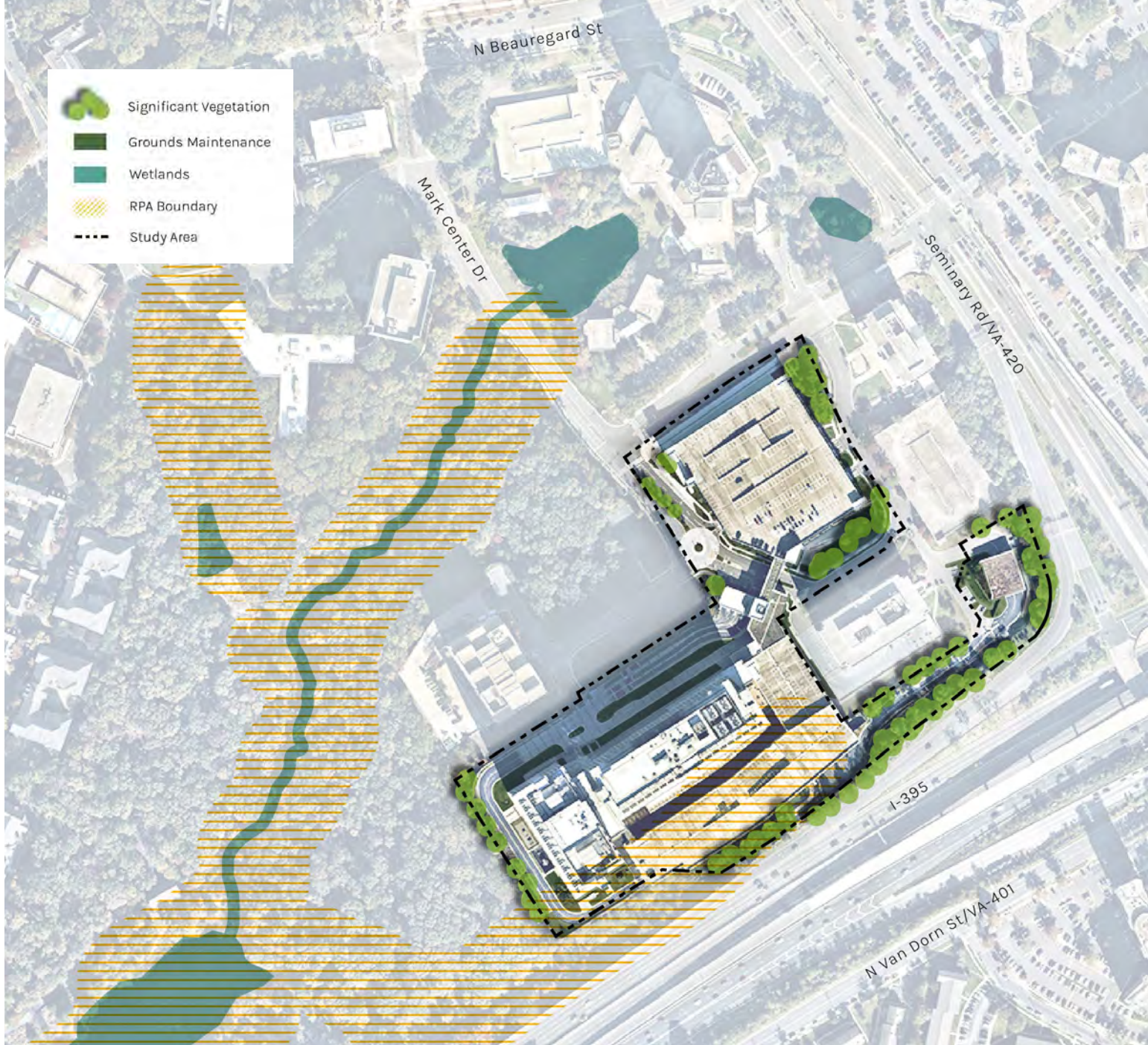


Figure 2-31 Mark Center Natural Features

There are currently no areas at the Mark Center designated as preserved land specifically to maintain a buffer between the civilian community and functions of the military installation, preserve valuable range and training land, provide land for future installation development, and/or conserve irreplaceable environmental habitat or cultural resources.

Cultural Resources

There are no historic properties recorded in the immediate vicinity of the Mark Center site. The nearest recorded historic property is Fort Ward (VDHR site number 100-0113), which is located approximately 0.6 miles to the west. There are no NRHP-listed historic properties or districts within view of the site, and there would be no adverse effects on cultural landscapes or NRHP property viewsheds. There are no known Native American sacred sites, traditional cultural properties (TCPs), or burial grounds on the Mark Center footprint.

Aesthetics and Visual Resources

The aesthetic quality of the surrounding areas varies from more heavily developed areas in the north, east, and south to forested areas to the west and northwest. In particular, the Winkler Botanical Preserve to the west provides a scenic natural contrast to development in the area.



Figure 2-32 Mark Center Security Elements

2.10.4 SECURITY ELEMENTS

The Mark Center's secure perimeter consists of fencing, barricades with access control, and walls. **Figure 2-32** shows the distribution of these security elements on the site.

Tenants

Some of the major employers at the greater Mark Center include the Washington Headquarters Services (WHS), Defense Human Resources Activity (DHRA), Office of the Secretary of Defense (OSD), Pentagon Force Protection Agency (PFPA), Defense Technology Security Administration (DTSA), DoD Inspector General (DoDIG), and DoD Education Activity (DoDEA).

TRANSPORTATION MITIGATION PROJECTS

Site Access

- » Improve Mark Center Drive to increase capacity. Provides needed capacity improvements on the frontage roadway to the buildings/parking structures to accommodate the influx of BRAC 133 employees at the site (see **Figure 2-33**).

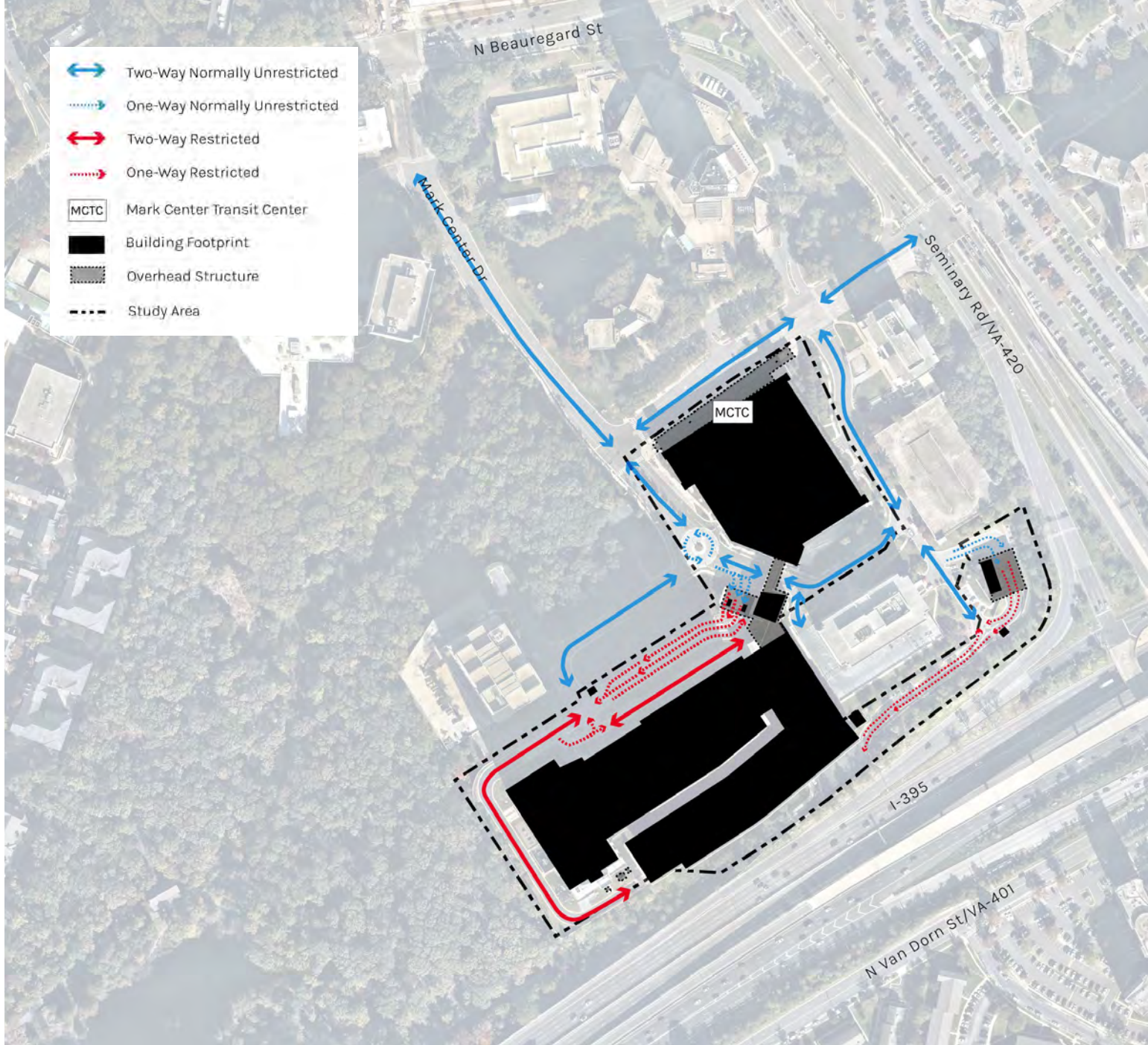


Figure 2-33 Mark Center Vehicular Circulation

2.10.5 VEHICULAR CIRCULATION

Regional Improvements

- » I-395/Seminary Road interchange improvements and HOV access ramp. Provides needed capacity improvements at the existing interchange and provides direct HOV access to/from the I-95/I-395 reversible HOV lanes (see Figure 2-33).
- » King Street (State Route 7) intersection improvements at Beauregard Street. Provides needed capacity improvements, reduces congestion, and improves traffic flow at the intersection.
- » Little River Turnpike intersection improvements at Beauregard Street. Provides needed capacity improvements, reduces congestion, and improves traffic flow at the intersection.

2.10.6 TRANSIT

The Mark Center Transit Center (MCTC) is the hub for mass transit and connection points to and from the Mark Center. The MCTC features 6 bus stops serving 19 different bus routes, including local Driving Alexandria Safely Home (DASH) to WMATA to commuter buses and private shuttles. More than 1,100 passengers use this facility on a normal (pre-Covid) weekday.

In addition to the many available transit options, the Mark Center provides a private shuttle as part of its TMP, available to tenants of participating property owners within the Mark Center development. (Mark Center shuttle service has currently been put on hold during the Covid pandemic. The Mark Center is evaluating the timing and continuation of this service.)

The Mark Center provides access to Metrorail via bus or shuttle ride to the Van Dorn Street, King Street, Pentagon City, and Pentagon Metro Stations on the Blue and Yellow lines. A regularly scheduled free shuttle bus service is provided to tenants of the Mark Center directly to the Pentagon Metro Station, 5 miles north of the Mark Center via I-395, which provides access to both the Blue and Yellow lines. Direct access at the I-395/Seminary Road interchange to and from the north on the HOV lanes allows the shuttle bus to use the HOV lanes during peak periods. Both Metrobus and DASH serve the Mark Center on Seminary Road, Beauregard Street, and Mark Center Drive.

Transit-related Amenities

The Mark Center features several amenities to make it easy to use transit, including:

- » Covered and well-lit areas that can be used to wait for buses
- » Schedules at all five bus bays in the MCTC
- » Mobile Commuter Store
- » Physical location of the Transportation Office providing information to DoD employees

The facility offers showers, bike racks, and lockers. The plan recommends holding a bike to work day (BTWD) event, giving out bike commuting information, automatically enrolling all not-driving employees in Guaranteed Ride Home, and considering developing a bike-sharing program and/or a bike station.

Future Transit

The city of Alexandria is in the process of developing three transitways that can make bus travel faster and more reliable for passengers. One of which, the West End Transitway, will connect to the Pentagon and Van Dorn Metrorail station. This service is anticipated to begin in 2025.

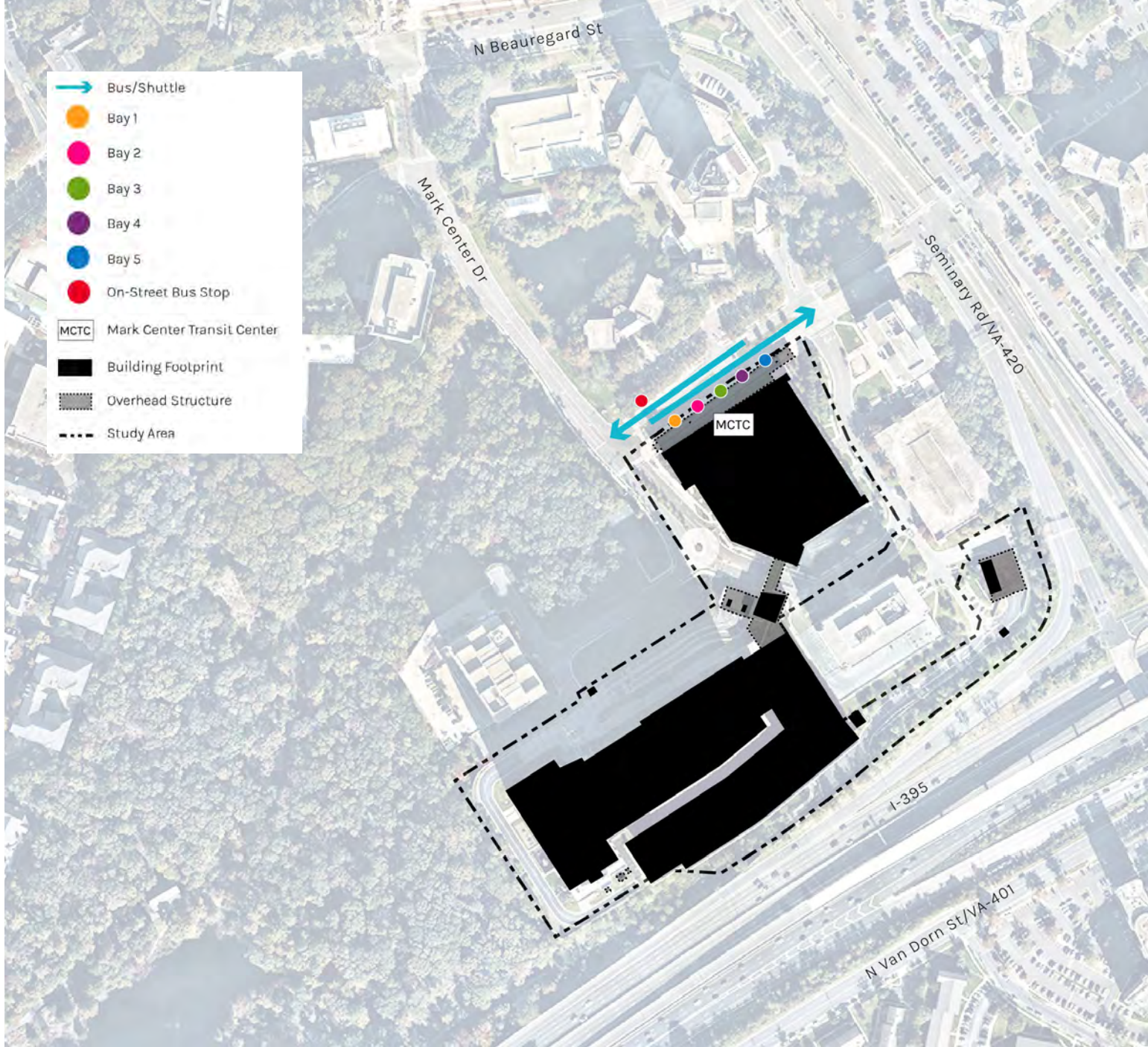


Figure 2-34 Mark Center Transit

2.10.7 MARK CENTER UTILITIES

Utility services available at the Mark Center site include potable water supply and distribution, sanitary sewage collection, electricity, natural gas, communications, and municipal solid waste collection.



Potable Water

Virginia American Water provides potable water for the Mark Center site. A network of 8- and 12-inch diameter waterlines along Mark Center Drive and Seminary Road, respectively, provide potable water supply to the existing buildings at the site. In addition, Virginia American Water has easements of various widths in the area complex to provide additional waterlines when required. The water is used for typical domestic water purposes but also is used for fire protection, cooling tower makeup, commercial kitchen use, and chilled water systems.



Stormwater

The Mark Center campus discharges stormwater from its impervious surfaces, including large parking garages, roadways, hardscape, and building footprint. In addition, condensate from the Mark Center's four dedicated outside air units (DOAUs) and blowdown water from the cooling tower system currently empties into the stormwater system. Blowdown from the cooling tower system is scheduled to be redirected to sewage in the near future.



Sanitary Sewage Collection and Treatment

Sanitary waste from the Mark Center site is collected by the city of Alexandria and treated at the AlexRenew treatment plant described above. A grid of 10-inch sewers along Mark Center Drive and other roads within the complex collect the sanitary waste from the existing buildings. Easements of varying widths are also available for installing future sanitary sewer infrastructure.



Electricity

Dominion Virginia Power (DVP) provides electricity supply to the Mark Center site. Electricity is used for HVAC, IT, lighting, and plug loads. Power supply lines enter the Mark Center by underground cables at the intersection of Mark Center Drive and Seminary Road and transverse the site in a southerly direction. Electrical transformers are located near the two existing buildings in the Mark Center footprint. A diesel (fuel oil) generator system provides backup electricity for mission-critical systems.



Natural Gas

Natural gas for the Mark Center site is provided by Washington Gas. An existing 12-inch gas main is in an easement adjacent to the Mark Center and the I-395 southbound ramp southeast of building 4825. Natural gas primarily fuels the Mark Center's boilers, which provides space and hot water heating for the campus.



Fuel Oil

The Mark Center maintains a supply of fuel oil for backup generators as well as the boilers during natural gas curtailment. The fuel oil system features two underground fuel oil tanks, four generator day tanks, and two hot water boiler day tanks. The system is designed with the capability to provide fuel oil to the emergency generators system during loss of normal power available at all times of the year.



Steam

Steam utility services are not currently available at the Mark Center site.



Chilled Water

The Mark Center employs two separate chilled-water loops: a latent loop and a sensible loop. The latent loop chilled water system provides 42°F chilled water to the DOAUs and main building air-handling units (AHUs) that serve occupant spaces in order to dehumidify latent loads. The mission-critical, emergency, air-cooled, chilled water system is to provide emergency chilled water to CRAC units, electrical rooms, and the Integrated Operations Center. Upon loss of power to the building, the emergency chilled water system shall activate to serve these mission-critical cooling loads in the main tower and the remote delivery facility.



Heating Hot Water

Hot water is supplied to various pieces of equipment and terminal units throughout the facility by means of the heating hot water (HHW) central plant. The system generates hot water by utilizing six dual fuel, water tube, hot water boilers. The boilers will operate primarily using natural gas, but the fuel oil system will provide No. 2 fuel oil to the boilers when the natural gas service is interrupted by the utility per the interruptible rate schedule.



Communications

Telecommunication services are provided by Verizon at the Mark Center site.



Solid Waste Management

Municipal solid waste from the existing buildings is collected by Potomac Disposal Services of Virginia for eventual disposal. Recycling is handled by World Recycling, Inc. Recycled waste is processed at their facility in Cheverly, Maryland.



Hazardous and Toxic Substances

Hazardous Waste Accumulation Area. A hazardous waste accumulation area is located within a storage room at the Mark Center loading dock. This storage room and surrounding areas are inspected daily by Mark Center staff and monthly by the WHS Environmental Compliance Team within ESB.

Special Hazards: Radon. The Mark Center site is in Environmental Protection Agency (EPA) Radon Zone 2, an area with a moderate potential for radon (average levels are between 2.0 and 4.0 picocuries/liter).

Other Special Hazards. Other special hazardous materials such as medical waste and radioactive materials have not been known to be used on the Mark Center site.

Figure 3-1 Master Plan



3.1 INTRODUCTION

CHAPTER 3 INCLUDES DESCRIPTIONS FOR PROJECTS AND OTHER INITIATIVES THAT ARE PLANNED OR PROPOSED AT THE PENTAGON OVER THE NEXT 0-20 YEARS.

THESE PLANNED EFFORTS ARE DESIGNED TO ACHIEVE THE MASTER PLAN GOALS AS ESTABLISHED FOR THE 2016 UPDATE AND CONFIRMED FOR THIS REVISION.



FIGURE 3-1 AND FIGURE 3-2 PROVIDE AN ILLUSTRATIVE DRAWING OF THE ULTIMATE, LONG-TERM PLAN FOR THE PENTAGON CAMPUS.

THE GOAL OF THE MASTER PLAN REVISION IS TO MAINTAIN, ENHANCE, AND OPTIMIZE DOD HEADQUARTERS/PENTAGON OPERATIONS, TO INCLUDE:

A large, faint, light-colored pentagonal graphic is overlaid on the left side of the page, partially behind the text boxes. It consists of multiple concentric pentagonal lines, creating a grid-like pattern within the pentagon shape.

Security

Improve DoD Headquarters and Pentagon security operations

Safety

Enhance the safety and quality of life of employees and visitors

Sustainability

Enhance environmental sustainability, security, and climate resilience on the Pentagon campus

Balance

Accommodate planning factors and development pressures

Accessibility

Enhance pedestrian and vehicular access

The 2016 Master Plan Update reflected many of the same features of the 2005 Master Plan but attempted to take a different approach in regards to sustainability, through the use of surface parking combined with stormwater management techniques versus structured parking with green roofs, which is more expensive and difficult to execute in the funding environment. This revision carries forward and expands upon this theme by decreasing the amount of parking and impervious areas while increasing green space.

The overall concept for the Master Plan Revision centers around five key planning features or elements, as follows:

1. Security

The first key feature of the plan is the updated security system planned for the Pentagon campus. As mentioned previously, security has already been a major focus of change in the exterior grounds of the campus following the 9/11 terrorist attack. The relocation of Route 110 away from the Pentagon was the largest of these changes and was reflected in the 2005 plan. However, many of the screening and other security facilities constructed after 9/11 were temporary in nature, and new permanent facilities are required for the long-term. These security features were packaged in an implementation initiative called the Sentry Program, and all permanent fences, barriers and entry control points included in it are reflected in this Master Plan Revision. A major objective of the Sentry program is to establish a secure and controlled perimeter around the Pentagon building, as well as augment the protection of other key support areas such as the HRP and a new Pentagon Support Operations Center (PSOC) facility. The perimeter fence/barrier system with controlled entry points for all vehicles and pedestrians will achieve a modernized security system for the Pentagon building and all other areas needing security for the foreseeable future.

2. Enhanced Safety and Quality of Life

The second key feature of the plan is the planned improvements to enhance safety and quality of life for employees and visitors. These include vehicular and pedestrian circulation improvements around the Pentagon campus and the renovation or replacement of the exterior Pentagon facilities, many of which are temporary buildings or past their expected life and need improvements to meet current mission requirements. Exterior Pentagon facilities include a new helipad control tower/fire station (included in the 2005 plan and 2016 update) and a new Pentagon Force Protection Agency (PFPA) facility called the PSOC. In addition, the Master Plan Revision plans several new functionally and aesthetically improved buildings and sites, including a renovated stage in the center courtyard of the Pentagon, electrical and power facility upgrades, and a covering for pedestrians using the Corridor 8 (COR8) bridge.

The existing circulation system is complex, with more than 26,560 employees as well as non-Pentagon employees traveling to and from the Pentagon campus each day. The Master Plan Revision is focused on improving the safety and security of the employees and visitors coming to and going from the campus, whether by car, bus, Metro, bicycle, or walking. In addition, the Master Plan Revision projects are intended to significantly improve the overall efficiency and operations of the vehicular, pedestrian, and bicycle circulation systems, particularly in the South Parking Lot area, to reduce vehicular-pedestrian conflicts and improve the commuting and visitation experience for all employees and visitors, respectively.



Pentagon Police Department



Pentagon Transit Center



BMP Initiatives to Aid Pentagon Sustainability Efforts

The projects will also ensure emergency vehicle access. These same improvements are described and included in the Transportation Management Plan (TMP) which was prepared in parallel and coordinated with the Master Plan Revision.

3. Enhanced Environmental Sustainability, Security, and Climate Resilience

Another key planning element is environmental sustainability. As mentioned in **Chapter 1**, the federal government is leading by example in encouraging sustainable development practices among its agencies through a variety of mandates and sustainability initiatives. The most recent DoD Sustainability Plan, published in 2022 in accordance with EO 14057, outlines the goals and performance expectations for all agencies within the department, such as WHS. The Sustainability Plan describes DoD priority actions related to climate resilience strategies and mitigation efforts to reduce greenhouse gas (GHG) emissions, increase efficiency, and reduce costs. The master plan team reviewed and analyzed many sustainable strategies to help WHS identify opportunities to meet the targets established in the sustainability report and implementation plan (SRIP) from a site perspective. Using site recommendations from a previous WHS study, the master plan includes a number of specific measures to improve stormwater management, such as reclaiming green areas, creating bioretention areas, constructing vegetated roofs on new structures, and other strategies. These measures will help WHS comply with stormwater management requirements, including pollutant load reductions, in the MS4 permit for the campus. The 2005 Master Plan also addressed the same issue by proposing five new parking garages with green roofs to replace much of the existing surface parking at the Pentagon campus. As mentioned previously, the 2016 update takes different, more costfeasible environmental measures by integrating environmentally prudent stormwater management measures into the existing parking lots, and projects to help mitigate the adverse environmental impacts associated with large amounts of impervious surfaces. These measures will help protect downstream water bodies, including the Potomac River and Chesapeake Bay, and improve overall water quality in the region. Master Plan Revision projects identified in the UESC (LED lighting, chiller replacements, water fixture replacements, building envelope upgrades, irrigation control upgrades, and refrigeration control upgrades) are targeted at reducing energy use at the campus.

4. Accommodate Planning Factors and Development Pressures

In addition to these focus areas, the Master Plan Revision attempts to strike an equitable balance among the numerous planning influences affecting facility development at the Pentagon campus, as described in **Chapter 1**. These planning factors are security, transportation/circulation, environmental protection and sustainability, historical context, community coordination, and stormwater management. Other factors affecting the campus that were also considered within the Master Plan Revision include development pressures on the campus, funding, safety, public access, historic preservation, and being a good neighbor. All of these factors were considered with a deliberate attempt to balance these sometimes competing concerns with the overall plan objectives to achieve a realistic and forward-thinking plan for the future of the campus.

5. Enhance Pedestrian and Vehicular Access

Improvements such as the replacement of deteriorated curbs and gutters, sidewalks, and driveways, as well as the addition of ABA-compliant sidewalks where missing (to address connectivity and ABA accessibility), are identified in this Master Plan Revision. The ongoing TMP strategies are described and graphically depicted as a connected transportation network of streets with sidewalks, pedestrian pathways, and bicycle trails, with the intent of reducing the distance between origins and destinations while increasing transportation alternatives.

The complete list of Master Plan Revision projects is provided in **Table 3-1** through **Table 3-5**. More detailed explanations of individual projects can be found in the component plans that comprise the Master Plan Revision in the following sections.

3.2 MASTER PLAN PROJECT SUMMARY

Table 3-1 Master Plan Revision Projects: Security and Safety



Table 3-2 Master Plan Revision Projects: New Facility and Land Use Changes

#	New Facility and Land Use Changes	Land Use Change	Shown on Map
1	North Village and PSOC Green/Support Space	Yes	Yes
2	Center Courtyard Stage and Stairs	No	Yes
3	Control Tower and Fire Day Station	No	Yes
4	Army-Navy Drive Offsite Parking Lots	Yes	Yes
N/A	REDACTED	REDACTED	REDACTED

Table 3-3 Master Plan Revision Projects: Circulation

#	Circulation	Shown on Map
1	Pentagon South Pedestrian Safety Project	Yes
2	Southeast Parking Project	Yes
3	North Parking Lot Improvements	Yes
4	Connector Road Bridge Upgrades	Yes
5	Connector Road and Boundary Channel Drive Intersection Improvements	Yes
6	Areawide Resurfacing and Rehabilitation	No
7	Areawide Sidewalk Improvements	No
8	Metro Entrance Pedestrian ACP	Yes
9	Pentagon Corridor 8 (COR8) Pedestrian ACP	Yes
10	Remote Delivery Facility Roof Project	Yes

Table 3-4 Master Plan Revision Projects: Environment and Sustainability

#	Environment and Sustainability	Shown on Map
1	South Secure Parking	Yes
2	Tree Box Filters	Yes
3	North Parking Bioretention	Yes
4	Old East Loading Dock	Yes
5	Corridor 5 Parking	Yes

Table 3-5 Master Plan Revision Projects: Energy

#	Energy	Mark Center Project	UESC Project	Shown on Map
N/A	REDACTED	REDACTED	REDACTED	REDACTED
2	Chiller Plant Upgrades	No	No	Yes
3	Thermal Energy Storage	No	No	Yes
4	Pilot Electric Vehicle (EV) Charge Stations	No	No	Yes
5	Pentagon-Wide Zero Emission Vehicle (ZEV) Fleet Infrastructure	No	No	No
6	Project Recommissioning/HVAC Efficiency Upgrade	No	No	No
N/A	REDACTED	REDACTED	REDACTED	REDACTED
8	Facility Related Control System (FRCS) Modernization	Yes	No	No
9	Light-Emitting Diode (LED) Lighting Upgrades	Yes	No	No
10	EV Charging Stations and Infrastructure	Yes	No	No
11	Optimize Data Center Performance	Yes	No	No
12	Variable Speed Primary Hot Water Pumping	Yes	No	No
13	Lighting Improvements	No	Yes	No
14	Domestic Water Improvements	No	Yes	No
15	Chilled Water Plant Improvements	No	Yes	No
16	Building Envelope Weatherization	No	Yes	No
17	Irrigation Improvements	No	Yes	No
18	Refrigeration Improvements	No	Yes	No

REDACTED

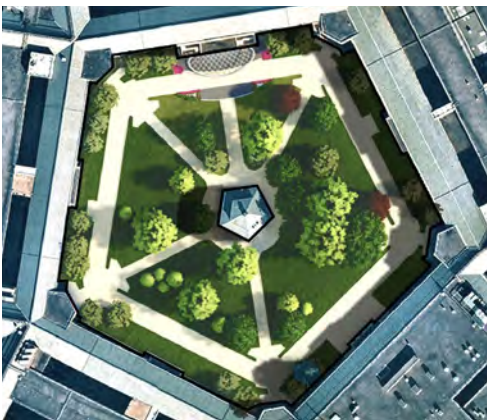
Figure 3-2 Master Plan Projects



Pentagon Transit Center - Public Transportation



HRP - Industrial/Utility



Center Courtyard - Open Space



North Village - Support

3.3 LAND USE

This revision generally retains the existing land use pattern on the Pentagon campus with a few proposed changes. These changes will reduce the impervious area at the Pentagon, reduce the amount of land dedicated to vehicular parking, provide additional green space, introduce more effective and sustainable stormwater management practices, and provide opportunity for new support spaces and revenues.

- » Conversion of certain parking areas into Green/Open Space with landscape areas and bioretention systems for stormwater management.
- » The eastern portion of the North Village is proposed as a combined Green/Open Space and Support. This is discussed further in [Section 3.5.1](#).
- » The parking areas along Army Navy Drive, beyond I-395 are proposed for a combination of uses, including primarily private, mixed-use, commercial development and Support uses. Green/Open Space and Public Transportation may also be included. Additional study is recommended to determine the most appropriate mix of uses based upon constructibility, security, sustainability, and market factors. This is discussed further in [Section 3.5.4](#). This area is designated under a new category, Mixed-Use/Support, that reflects the potential combination of uses in this area.

1. Administration

The Pentagon building will continue to represent the primary administration land use on the Pentagon campus, with approximately 35 acres. No planned new Administration land use areas are proposed in this revision.

2. Industrial/Utility

Three areas of the Pentagon campus will remain designated Industrial/Utility. They include the heating and refrigeration plant (HRP) located on the southeastern edge of the campus, an area just north of the HRP site providing a utility connection from the Pentagon Lagoon to the HRP, and an area adjacent to the River Terrace in the North Secure Parking Lot. No additional Industrial/Utility areas are proposed.

3. Support

The primary areas identified as Support on the Existing Land Use map will remain, with one proposed modification. The eastern area of the North Village will transition from the Support function to a new Green Space/Support hybrid category. While this area will have the predominant character of Green Space, it will accommodate other uses. A more detailed description of the future character, development, and uses of this area is provided in [Section 3.5.1](#).

4. Mixed-Use/Support

This category has been created to reflect a land use pattern that may contain a mixture of uses, including private development and Support as the primary functions. These areas could also include green space and public transportation uses integrated into a development.

5. Green/Open Space

Green or open space on the Pentagon campus will increase slightly from 79 acres to approximately 85 acres. For the purposes of this calculation, the hybrid Green Space/Support category area of the North Village is counted under this category. Some of the initiatives that contribute to the increase in green space on the campus include the following projects:

- » Conversion of existing laydown areas near the Pentagon building into green space
- » Conversion of certain parking areas into green space with landscape areas and bioretention systems for stormwater management
- » Conversion of a portion of the North Village to a hybrid Green Space/Support

In addition, the existing green areas on the Pentagon campus are included in the Green/Open Space land use category, as they were on the existing land use map. They include the Center Courtyard, 9/11 Memorial, David O. Cooke Terrace, River Terrace, and the green space along Boundary Channel Drive adjacent to the Pentagon Lagoon.

6. Green Space/Support

This category has been created to reflect the hybrid use of a portion of the North Village. Land under this category is characterized as having the general appearance of green space while being programmed for, and potentially containing, minor facilities for other uses such as outdoor training, recreation, and landscape maintenance/nursery.

7. Public Transportation

The existing public transportation land use, which includes land designated for the PTC and a ridesharing area, will remain the same.

8. Parking/Vehicular Access Land Use

TMDL projects in parking areas will decrease the amount of impervious surface and increase green space and vegetation. These will help to reduce the heat island effect, improve stormwater management, increase landscaped amenities, and provide areas for employees and visitors working at or visiting the Pentagon campus to enjoy.

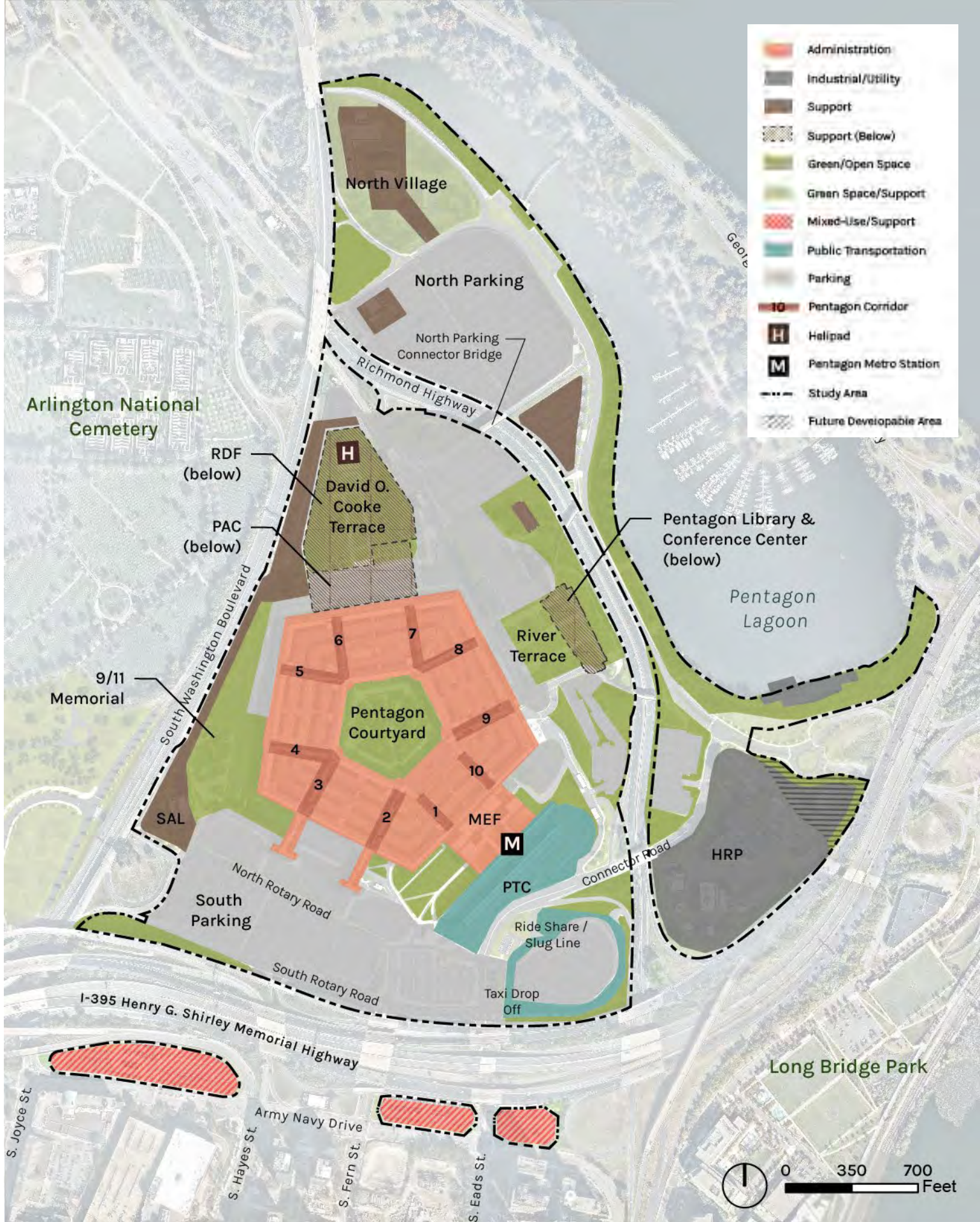


Figure 3-3 Pentagon Planned Land Use

3.4 SECURITY AND SAFETY PROJECTS

Table 3-6 Master Plan Revision Security and Safety Projects

REDACTED		

REDACTED

Figure 3-4 Planned Security Features

REDACTED

REDACTED

REDACTED

REDACTED

REDACTED

REDACTED

REDACTED

3.5 NEW FACILITY AND LAND USE CHANGES

To respond to the need to modernize and consolidate Pentagon support facilities, several new facility projects are included in this Master Plan Revision. It should be noted that these projects are still under development and could change based on further review and/or funding limitations. To maintain consistency in design across the Pentagon campus, the exterior design and development of these facilities and site elements, particularly with respect to material palettes and façades, shall refer to the guidelines established in the 2016 Pentagon Site Exterior Standards Manual.

The new facilities proposed for the Pentagon are limited. These facilities include some that were included in the 2016 update as well as others that are new. The sections below describe new facilities and provide more detail for proposed land use changes. The planned projects include the following:

Table 3-8 Master Plan Revision New Facility Projects

#	New Facility and Land Use Changes
1	North Village and PSOC Green/Support Space
2	Center Courtyard Stage and Stairs
3	Control Tower and Fire Day Station
4	Army-Navy Drive Offsite Parking Lots
N/A	REDACTED

3.5.1 NORTH VILLAGE AND PENTAGON SUPPORT OPERATIONS CENTER GREEN/SUPPORT SPACE

The North Village has been significantly redeveloped since the 2016 update. The PSOC and outdoor K-9 facilities are nearing completion and in use. The planned VACP and pedestrian ACP are under construction. While these developments account for the majority of future uses on the site, the eastern portion of the site remains for consideration. This area is currently occupied by green space, landscape operations, and the Modular Office Complex (MOC). The MOC remains a temporary use at this time; however, functions assigned to the MOC will be relocated and the MOC will ultimately be demolished. The 2005 Master Plan had previously contemplated a significant portion of the North Village being repurposed as green space. This revision revisits that concept and proposes that the green space area along the eastern edge of the North Village be expanded to cover the area vacated by the MOC demolition. The area would function as hybrid Green Space/Support. In addition to general green space, the area should include outdoor training areas to support PFFA and K-9 functions, recreational uses, landscape maintenance/nursery storage, and low-impact design elements.

The area's adjacency to the Boundary Channel makes this use complementary to its natural surroundings while also functioning as a support area for PFFA. The overall impact of the proposed concept will be to reduce impervious areas including parking, reinforce and expand the green edge along the Boundary Channel and provide occupants of the PSOC with opportunities for training, recreation, and an enhanced environment.

3.5.2 CENTER COURTYARD STAGE AND STAIRS

The existing stage in the Pentagon Center Courtyard is a temporary structure and not sufficient for ceremonial and other events that take place in this location. Additionally, issues with deterioration and safety requirements necessitate improvements be made to the egress stairs behind the stage. For this reason, a project is planned to replace the stage with a new facility and to correct deficiencies with the stairs. The design for the stage will include technology upgrades. The stair portion of the project will draw heavily from lessons learned and design elements from the completed Apex Stairs project, also located in the Center Courtyard. **Figure 3-5** shows a proposed design concept. To advance further, the project requires design coordination with the historic preservation review agencies (VA SHPO, Advisory Council on Historic Preservation [ACHP], NCPCH, CFA, etc.) since the Central Courtyard is one of the six contributing resources of the Pentagon NRHP designation as described in **Section 2.1.2**.



Figure 3-5 Rendering of Proposed Center Courtyard Stage

3.5.3 CONTROL TOWER AND FIRE DAY STATION

A replacement control tower and fire day station facility was included in the 2016 update. These projects are carried forward into this document. The existing fire station and control tower are located in temporary facilities near the remote delivery facility (RDF). These temporary facilities, constructed after 9/11, are exhibiting various states of wear and tear. A new combined fire station and heliport control tower will be located on the southwest side of the RDF at the site of the existing temporary facility (see [Figure 3-6](#)). The existing facility will be relocated and will continue to operate while the new facility is being constructed, to ensure continuity of operations. The current facility will be removed once the new facility is completed. The location gives the control tower a clear view of the heliport and aircraft flight path. The control tower and fire day station requirements are based on the findings of the Pentagon Heliport Study, which will be used to help guide the detailed design process. The project's exact siting and design have been determined during the detailed design process.

The control tower and fire day station will only service the heliport operations (fire and emergency services for the Pentagon building are provided by Arlington County). The fire station will be a one-story fire truck garage with space for two fire trucks and equipment and a one-story support space with accommodations for staff and a dispatch office. The attached control tower will provide space and equipment for personnel to oversee helicopter operations using the heliport. Currently under construction, when complete the control tower will be four stories tall, with the ground floor housing the fire station and control tower support space (see [Table 3-9](#)). As with all other new construction projects at the Pentagon campus, the building is planned to meet the USGBC's LEED Silver certification.

The heliport will remain in its existing location on the David O. Cooke Terrace deck on top of the RDF (see [Figure 3-6](#)); however, the heliport is being rebuilt to improve structural systems and meet current regulations related to the shape of the pad. The reconstructed pad will be square. Emergency and very important person (VIP) access to the heliport will continue via the pedestrian path extending out from the Mall Terrace and via restricted vehicular access from the Mall Terrace. In addition to the landing pad, the existing area for three to four standby parking spaces for waiting helicopters will remain.

The existing heliport site allows screening from general public views, primarily from Route 27 and Route 110 via the existing wall and vegetated berm between the roadway and the Pentagon campus along the western side of the heliport. Given the elevation differences between the heliport and the roadway on the east side, proper evergreen vegetation located there would not grow high enough to be a flight hazard yet could suitably screen operations activity.



Proposed Control Tower and Fire Day Station



Control Tower and Fire Day Station Rendering with Vegetated Roof

EMERGENCY EQUIPMENT ACCESS TO THE HELIPAD

Safety standards require that fire and rescue personnel and equipment have ready access to the helipad landing area. In accordance with DoDI, the aggregate response time (ART), which is the time elapsed from the receipt of an emergency alarm to when the first units arrive on the scene of an aircraft incident, is 5 minutes or less. For a structure incident, the ART is 7 minutes or less. The aircraft rescue and firefighting (ARFF) equipment response time is 1 minute or less for equipment which is “pre-positioned” near aircraft operations. The emergency fire and rescue equipment, co-located in the permanent control tower and fire day station building with the control tower, will meet the response time requirement. All roadways leading to the helipad from the emergency vehicle structure and staging areas will need to meet standard roadway and turning radii required for emergency vehicles.

SECURITY CRITERIA

The planned fire station control tower location meets three important security criteria that govern helipad operations:

1. Visual screening of the aircraft and passengers on the landing area from surrounding roadways, which can be achieved with evergreen vegetation planted between the helipad and Route 27 to the east and Route 110 to the west.
2. Convenient access to the landing area for PFFA and fire personnel.
3. Restricted vehicular and pedestrian access into the helipad area.

Table 3-9 Fire Station/Control Tower Functional Space

Function	Space Requirement (SF)
Apparatus Bay	2,640
Living Quarters/Fire Station Support Spaces	1,685
Control Tower and Support Spaces	1,057
Total	5,382

Note: SF space requirements are subject to change dependent on final DoD and Congressional approvals. Space requirements are listed in net SF.



Figure 3-6 Control Tower and Fire Day Station with Helipad

3.5.4 ARMY NAVY DRIVE OFFSITE PARKING LOTS

The Pentagon maintains three surface parking lots south of I-395 along Army Navy Drive: South Hayes Street, South Fern Street, and South Eads Street parking lots (see [Figure 3-7](#)). In addition to providing vehicular parking, the Hayes Street lot currently provides pick-up and drop-off locations for tour buses and has been considered for additional bus transit functions. In recognition of the high-density, mixed-use environment and the major regional economic development impact of the Amazon Second Corporate Headquarters (HQ2) project, it is proposed that these parking lots be considered for land use types that provide a more positive impact than surface parking. The range of uses considered should include commercial uses, support uses for the Pentagon, and pedestrian and transit enhancements. Commercial uses could include secure facilities for DoD contractors, amenities for Pentagon employees and visitors, or other commercial development. Development could also include space to house as of yet unidentified support uses. If needed, development could also be designed to potentially incorporate transit facilities and green space. The positive impacts of development on this land could include additional green space, revenues from development, and enhanced security by placing certain uses outside of the secure perimeter.

While the demand for land development in this area remains high, development of these parcels does come with challenges that would need to be addressed. The narrow dimensions of the sites, particularly the Eads Street lot and Fern Street lot may complicate construction. This dynamic could be further complicated by the proximity to I-395. Security concerns and aviation concerns, as well as aesthetic concerns related to the Pentagon's status as a historic landmark, could limit development height, thereby impacting financial feasibility. Finally, standard issues of constructibility that could apply to any site, such as utility conflicts, environmental concerns, soil conditions, and others could negatively impact financial feasibility and suitability. Despite these challenges, the economic development dynamics of Pentagon City along with the potential benefits to the Pentagon suggest strongly that further study of this area should be conducted to identify the most appropriate use for these sites. This revision identifies these parking lots for future development under the Mixed-Use/Support category. This revision also proposes an effort be conducted to first determine the potential base feasibility of development on these sites. If development is shown to be feasible, then a focused effort on developing a vision for the three parking lots should be conducted to determine the final mix of uses and form of development.

3.5.5 REDACTED



Figure 3-7 Army Navy Drive Parking Lots Redevelopment



The new HQ2 and existing mixed-use developments in Pentagon City position the Army Navy Drive parking lots for redevelopment.

3.6 CIRCULATION PROJECTS

The Master Plan Revision includes significant improvements to the complex circulation systems on the South Parking Lot of the Pentagon campus, in terms of vehicular, parking, pedestrian, and bicycle systems. **Table 3-10** lists the circulation projects:

Table 3-10 Master Plan Revision Circulation Projects

#	Circulation
1	Pentagon South Pedestrian Safety Project
2	North Parking Lot Improvements (SWM and LED Lamping)
3	South East Parking Project
4	Connector Road Bridge Upgrades
5	Connector Road and Boundary Channel Drive Intersection Improvements
6	Areawide Resurfacing and Rehabilitation
7	Areawide Sidewalk Improvements
8	Metro Entrance Pedestrian ACP
9	Pentagon COR8 Pedestrian ACP
10	Remote Delivery Facility Roof Project

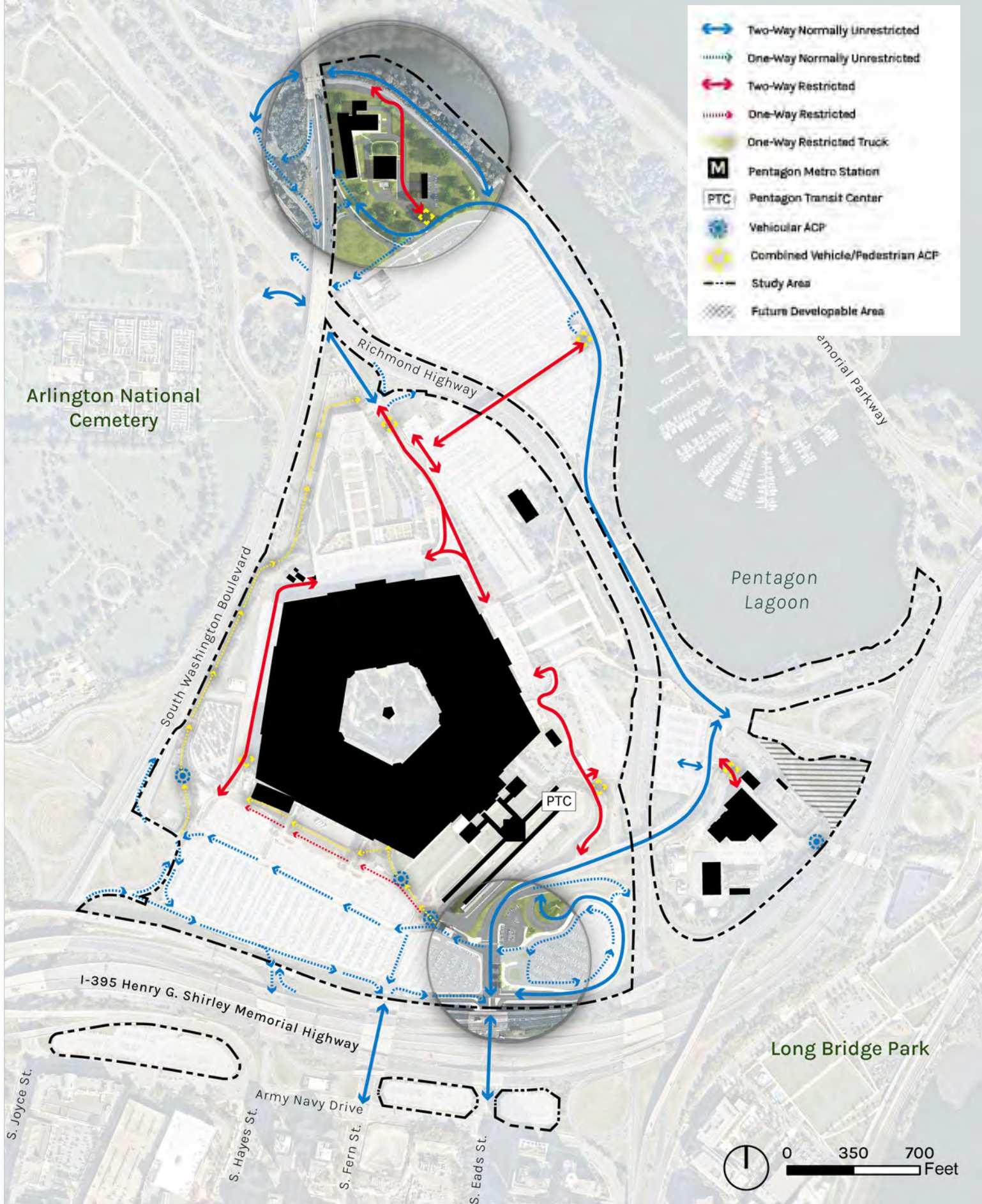


Figure 3-8 Planned Vehicular Circulation

3.6.1 PENTAGON SOUTH PEDESTRIAN SAFETY PROJECT AND SOUTH EAST PARKING PROJECT

The Pentagon site and the PTC accommodate more than 26,560 employees traveling to and from the site every day, while also serving regional commuters as a major regional transportation node. Recent southeast safety traffic and parking improvements addressed issues related to direct access to the PTC, ride-sharing area, and taxi stand. However, various issues remain.

A major change is planned in the South Parking Lot to improve the safety, security, and efficiency of the vehicular and pedestrian circulation system, create a strong pedestrian network, and improve sustainability features.

Figure 3-8 shows the circulation around the Pentagon campus. Figure 3-9 shows the vehicular connections between the south portion of the Pentagon site and Arlington County, which occur via Columbia Pike, Route 27, I-395, South Fern Street, and South Eads Street. Figure 3-10 illustrates the South Parking Lot reconfiguration elements for circulation.

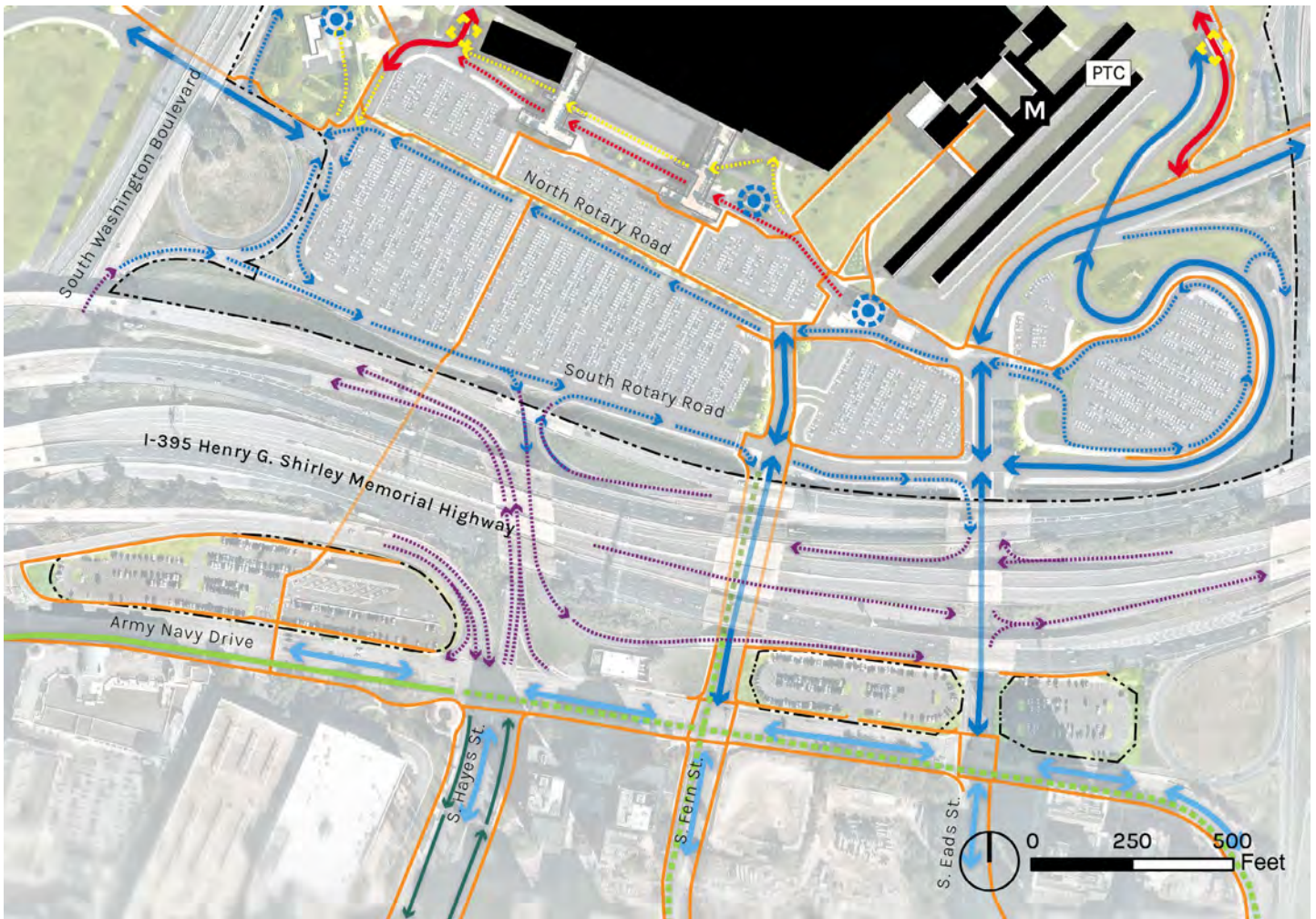


Figure 3-9 Planned Vehicular Circulation: I-395 Connectivity Detail

The Pentagon south pedestrian safety and south east parking components are as follows (see **Figure 3-10**):

- 1. Pedestrian gateways and signalized crosswalks** - Walkways will be defined and sidewalks and crosswalks increased to improve pedestrian safety. Raised crosswalks with advanced pedestrian warning systems will be installed on North and South Rotary Roads that connect to the I-395 pedestrian tunnel and the pedestrian walkway through the South Parking Lot.
- 2. Signalized intersections and crosswalks** - Signalized intersections will be implemented along North and South Rotary Roads at South Fern Street and South Eads Street/Connector Road.
- 3. Realign roadways and sidewalks to improve traffic flow** - The Connector Road, North Rotary Road, and South Eads Street intersection will be realigned to create a four-leg intersection, and two-way access will be provided on South Fern Street with pedestrian connections to Arlington County's Green Ribbon network in Pentagon City.
- 4. Parking circulation** - Some parking lanes on the western side of the South Parking Lot area will be reconfigured to provide more efficient internal circulation and limit the number of vehicles onto South Rotary Road.
- 5. Pedestrian and bicycle connectivity to Columbia Pike** - Pedestrian and bicycle circulation systems currently connect and will continue to connect to Columbia Pike.
- 6. Wayfinding signage** - Signage will route non-Pentagon employees between the Metrorail station and the bus bays at the PTC, as well as to the 9/11 Memorial and the Metro Entrance Facility (MEF) visitor ACP.
- 7. Bicycle routes on North and South Rotary Roads** - Signed on-street bike routes will be incorporated on North and South Rotary Roads.
- 8. Stormwater management measures** - Several BMP measures and techniques are planned for the South Parking Lot area to help manage stormwater, reduce the heat-island effect, and improve the overall aesthetics of a public area which numerous employees and visitors walk through on a daily basis.
- 9. LED Lamping** - The existing lighting will be replaced with energy-efficient LED fixtures.

Note: South Parking Lot projects continue to be implemented. Status of design and construction is subject to change and may differ from what is described in this plan.



Figure 3-10 Pentagon South Pedestrian Safety and Southeast Parking Components

3.6.2 NORTH PARKING LOT IMPROVEMENTS

Stormwater management (SWM) and pedestrian safety improvements are planned in the North Parking Lot and along Boundary Channel Drive to reduce vehicular-pedestrian conflicts in the area and provide for a more comfortable and aesthetically pleasing pedestrian experience (see [Figure 3-11](#)).

- 1. Boundary Channel Drive pedestrian improvements** - A new and improved sidewalk for pedestrians is planned along the Boundary Channel Drive curve to better provide for pedestrian connections. In addition, regularly spaced street trees will be added along the roadway, and existing canopy trees will be retained. These improvements will better accommodate Pentagon employees, including those who use the route for running during the day as part of their exercise regimen.
- 2. Pedestrian connection** - A pedestrian path is planned to run through the North Parking Lot from the circulator stop near the North Village ACP to the North Parking Connector Bridge and the Boundary Channel VACP/Boundary Channel Drive. The tree-lined walkway will provide a shaded pedestrian connection through the North Parking Lot that incorporates BMP measures. The walkway design will maintain vehicular circulation through the lot while providing a designated space for pedestrians.
- 3. BMP measures** - Similar to the South Parking Lot, several BMP measures and techniques are also planned for the North Parking Lot area (See [Section 3.7](#)).
- 4. Special events** - Many organizations use the Pentagon campus surface parking lots for special events, such as the Presidential Inaugural Parade, Rolling Thunder, and the Marine Corps Marathon. The North Parking Lot will continue to host special events. The SWM features planned for the lot will retain large parking bays to accommodate these types of events.
- 5. LED lighting** - Energy-efficient LED fixtures will be added. A portion of this work has been implemented.



View of Existing North Parking Lot (Looking North)



View of Existing North Parking Lot (Looking West)



Figure 3-11 Illustrative of North Parking Area

3.6.3 CONNECTOR ROAD IMPROVEMENTS

1. Connector Road Bridge Upgrades

There are two bridges along Connector Road: One over Route 110 and another over North Rotary Road (just south of the PTC). Sidewalk widths on both bridges will be upgraded to meet ABA requirements. This project will address the existing pedestrian safety and connectivity issue.



Upgrade Sidewalk Width Deficiency along PTC and Route 110 Bridges

2. Connector Road and Boundary Channel Drive Intersection Improvements

This intersection is currently unsignalized and has various potential conflict points. Northbound and southbound traffic on Boundary Channel Drive, Connector Road traffic, and traffic from the I-395 ramp create many conflict points and potentially unsafe conditions. WHS is working with VDOT and the design-build engineer to evaluate the impacts and appropriate reconfiguration of the intersection to address the safety and mobility issues at this intersection.



Upgrade Boundary Channel and Connector Road Intersection to Reduce Conflict Points



Rehabilitate Deteriorated Pavement in North Parking Lot



Rehabilitate Deteriorated Pavement in South Parking Lot



Realign Sidewalk Ramp/Pedestrian Crossing



Install Missing Sidewalk Section

3.6.4 AREAWIDE RESURFACING AND REHABILITATION

This project will provide periodic resurfacing and upgrading of roadway and parking lot pavements within the Pentagon site. These improvements may include, but are not limited to, milling, patching, sealing, resurfacing, and restriping of existing deteriorated pavements.

3.6.5 AREAWIDE SIDEWALK IMPROVEMENTS

Similar to areawide resurfacing, this project will address connectivity and safety issues related to sidewalks. These improvements include replacement of deteriorated curbs and gutters, sidewalks, and driveways as well as addition of ABA-compliant sidewalks where missing to address connectivity and ABA accessibility within the Pentagon campus.

3.6.6 TRANSIT

The Master Plan Revision includes projects to better accommodate buses to the PTC, as well as personnel informally carpooling to the Pentagon (which includes both Pentagon and non-Pentagon employees). As described in [Section 3.6.1](#), a dedicated two-way bus lane has been installed on the outside perimeter of the eastern portion of the South Parking Lot. An existing underpass beneath Connector Road provides direct access to the PTC for transit vehicles. A ridesharing area (‘slug’) with a dedicated lane and waiting area is provided in the eastern parking lot, along with a taxi drop-off (see [Figure 3-12](#)).



Aerial View of the Pentagon Transit Center

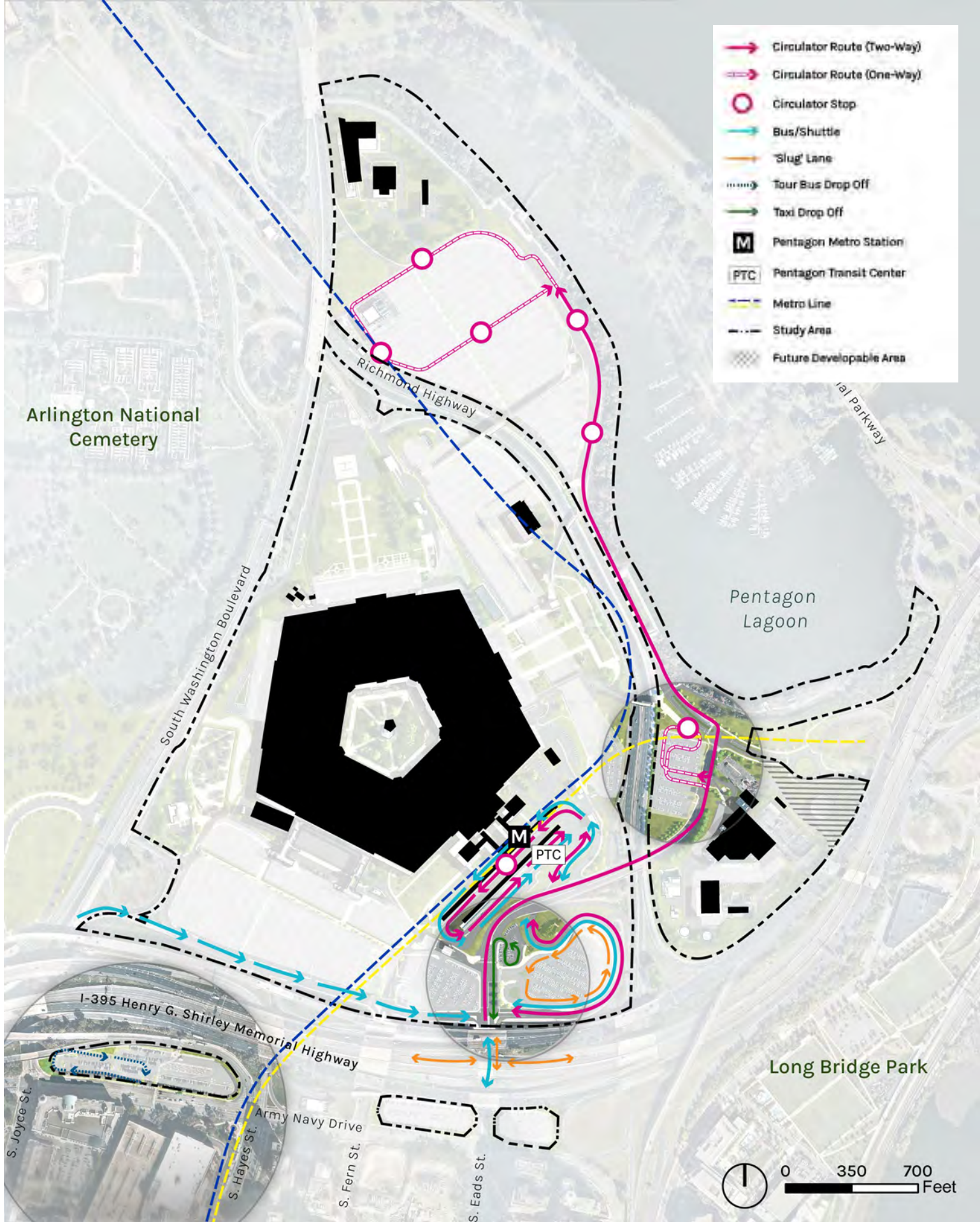


Figure 3-12 Planned Transit Circulation

3.6.7 PEDESTRIAN AND BICYCLE CIRCULATION

One objective of the Master Plan Revision is to improve the overall pedestrian and bicycle circulation on the Pentagon site by eliminating conflict areas, improving connections, and adding new connections where needed (see [Figure 3-13](#) and [Figure 3-15](#)). The Master Plan Revision connects the external trails surrounding the Pentagon campus with routes on the campus in order to provide Pentagon employees a clear and direct route from the external trails to the employee bicycle racks and pedestrian entrances on the campus.

PEDESTRIAN IMPROVEMENTS

The southeast safety traffic and parking improvements projects addressed some of the pedestrian conflicts by providing a dedicated bus lane to and from the PTC on the outside perimeter of the South Parking Lot commuter plaza and a dedicated rideshare lane with a waiting area for smooth circulation, minimizing conflicts between pedestrians and cars in the parking lot. The planned vehicular improvements will alleviate remaining issues through the following measures:

- » The signalization of intersections along North and South Rotary Roads will allow for safer pedestrian crossings.
- » A reduced number of access points to parking areas at South Rotary Road will improve traffic flow and enhance traffic and pedestrian safety.

The Master Plan Revision projects improve a number of inadequate or missing pedestrian connections. These include:

- » Increased sidewalk and crosswalk widths will allow for safe pedestrian queuing and more efficient crossing.
- » The installation of raised crosswalks and a walkway through the South Parking Lot and advanced pedestrian warning systems at the crosswalks along North and South Rotary Roads will allow for safer pedestrian crossings and provide a better connection to the I-395 pedestrian tunnel.
- » Improvements to the South Parking Lot pedestrian walkway that connects the PTC and the Metro with the 9/11 Memorial on the north side of North Rotary Road will provide a more inviting pedestrian environment that incorporates canopy trees and perimeter security elements.
- » Improved sidewalk segments in the northeastern portion of the North Parking Area will keep runners on the sidewalk and out of the parking lot.
- » Increased green space and landscaped islands in the South Parking Lot will improve pedestrian comfort.
- » The provision of a tree-lined pedestrian route through the center of the North Parking area will allow for shorter trips for those who park in the middle of the lot.
- » Regularly spaced street trees on roadways, following the latest UFC 2-100-01 guidance will provide shade and reduce urban heat island effect.

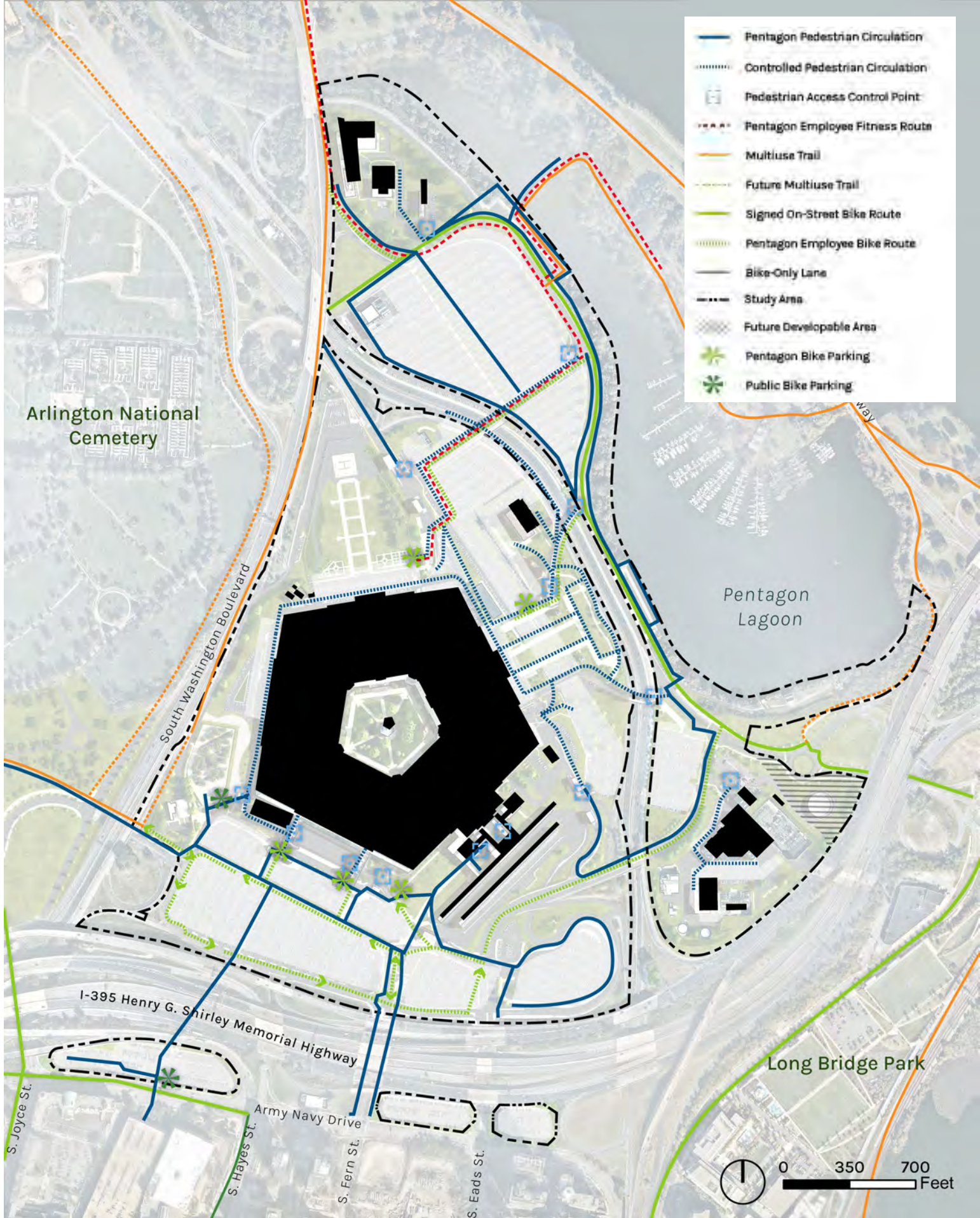


Figure 3-13 Planned Pedestrian and Bicycle Circulation

Note: Controlled pedestrian circulation routes are accessible only after passing through an ACP. Pentagon employee bike routes are signed for Pentagon/DoD badge holders only.

METRO ENTRANCE PEDESTRIAN ACCESS CONTROL POINT

This project will provide a redeveloped ACP and employee screening facility located at the Pentagon entrance adjacent to the Pentagon Metro Station. The Metro access control point (MACP) will provide increased security and capacity for the PFFA to safely and expeditiously screen thousands of DoD employees daily prior to entrance into the Pentagon, provide space for PFFA officers to work, and allow for enhanced screening in accordance with random AT/FP security measures.

The existing employee screening system does not currently meet the requirements of Homeland Security Presidential Directive (HSPD) 12 for safety, security, surveillance, screening, detection, AT/FP, or pedestrian throughput capacity. As part of the overall existing MEF, the current employee ACP was designed and constructed as a temporary solution in response to increased security requirements post 9/11.

The redeveloped MACP will provide the following:

- » Increased throughput (to enable employees to scan badges and enter the Pentagon without extensive queuing, even during peak arrival times).
- » Enhanced forms of identification and security used to gain access to secure facilities.
- » Improved safety and security of Pentagon tenants and attending PFFA officers
- » Improved operational efficiencies.
- » Safe and expeditious egress in case of emergency.
- » Integration of outdoor and indoor spaces.



Conceptual MACP Site Plan



Conceptual Corridor 8 ACP

CORRIDOR 8 ACCESS CONTROL POINT

The objective of the Corridor 8 ACP is to build a new pedestrian ACP that replaces the existing police booth at Corridor 8. The new building will provide increased capacity for employee and visitor screening with connections to the North Secure Parking and North Parking areas. The existing Corridor 8 basement entrance will be activated to provide an accessible entrance from the North Secure Parking Lot. Sitework around the building will provide enhanced handicap and nonhandicap vehicular striping.



Structural Upgrades to Accommodate V-22 Osprey Access

3.6.8 REMOTE DELIVERY FACILITY ROOF PROJECT

The objective of this project is to repair and convert the RDF roof helipad system into a helipad facility which sustains safe operation (landing, takeoff, and parking) of the fleet of military helicopters (including Group MV-22 [Osprey] and Group H-60 aircraft), and to do so without compromising the structural integrity of the RDF structure. In addition to structural strengthening, exterior site, environmental, air traffic control, electrical, drainage, backfill, waterproofing, and irrigation system adjustments are required to sustain RDF roof helipad safe operation.

3.6.9 BICYCLE CIRCULATION IMPROVEMENTS

The reduction of conflict areas will also improve the overall bicycle circulation on the Pentagon campus. Plans to further improve bicycle circulation on the campus include:

- » The provision of signed on-street bike routes (sharrows) on selected roadways (North and South Rotary Roads, Boundary Channel Drive, and Connector Road; see **Figure 3-14**).
- » Coordination with Arlington County to facilitate the county's installation of a fence and a multiuse trail connection along Boundary Channel Drive and the Pentagon Lagoon that will connect to a signed public bike route from the proposed roundabout on Boundary Channel Drive to Long Bridge Park. Areas north of the multiuse path intersection with the roundabout will be signed as restricted to DoD/Pentagon badge holders only.
- » Two new Pentagon employee bike racks in addition to the existing 46 racks.
- » A public bike rack in the Hayes Street Parking Lot, south of I-395, in addition to the existing public bike rack at the 9/11 Memorial.

A recurring comment from the Pentagon Transportation/Commuter Survey was that more employees would be willing to bike to work if shower facilities were available for general use inside the Pentagon. WHS analyzed the feasibility of providing additional showers for bicycle commuters in restrooms near several of the main building entrances. Locker and shower facilities for bicyclists and pedestrians will be added within the Pentagon building at the bike rack entrances (Corridors 2, 3, and 8), pending space availability. Communicating implemented bicycle and pedestrian circulation improvements is a priority and will occur as described in the 2015 TMP to promote alternative means of transportation to, from, and around the Pentagon campus.

The coverage of Arlington County and the District Department of Transportation's (DDOT's) Capital Bikeshare program will be expanded to include the Pentagon campus. Many bikeshare program stations are strategically distributed throughout the city, allowing people to rent and return the bikes from one mobility hub to another easily and affordably. Renting a bike from one station and dropping it off at another is as easy as unlocking it with phone, riding, and simply docking it at a station near the destination. However, there is a lack of assigned stations within the Pentagon campus. Strategically adding and spreading stations will add micromobility services, meeting transportation, quality of life, and sustainability goals.

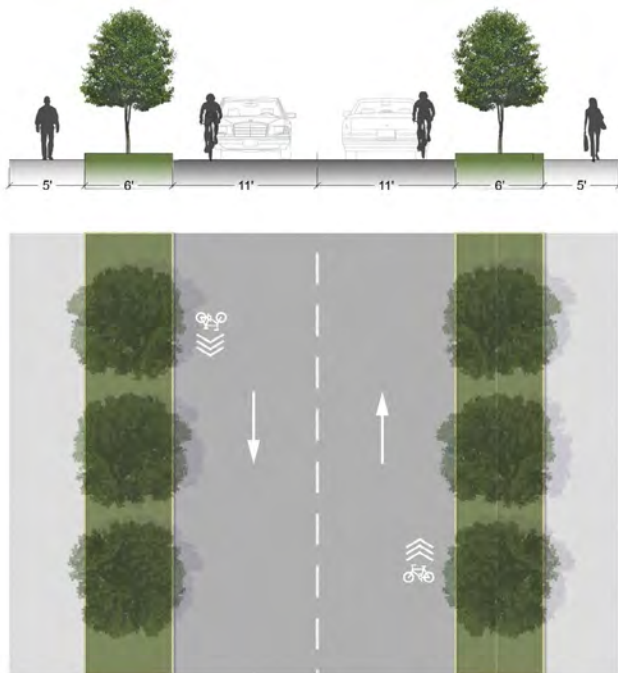


Figure 3-14 Pedestrian and Signed On-Street Bike Route Concept

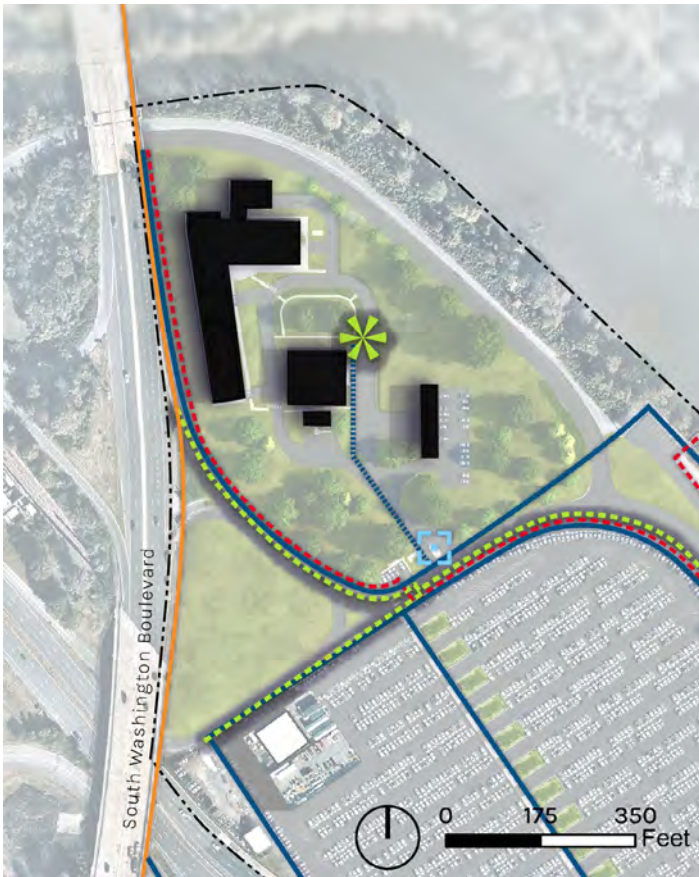


Figure 3-15 Planned Pedestrian and Bicycle Circulation: Trail Connectivity Details

3.7 ENVIRONMENT AND SUSTAINABILITY PROJECTS

The DoD publishes an annual sustainability plan that outlines goals and performance expectations for DoD military departments and field services, establishing the path by which DoD will achieve EO 14057 goals and serve as the model of sustainability for the nation while enhancing its ability to achieve mission objectives. The sustainability plan was most recently updated in 2022. The Master Plan Revision incorporates sustainable strategies to enable the Pentagon to progress towards meeting the targets established in the sustainability plan to leave the smallest impact possible on environmental resources. Additional strategies are discussed in [Section 3.8](#), Energy Projects.

Table 3-11 Master Plan Revision Environment and Sustainability Projects

#	Environment and Sustainability
1	South Secure Parking
2	Tree Box Filters
3	North Parking Bioretention
4	Old East Loading Dock
5	Corridor 5 Parking

In December 2021, EO 14057 was released, which revoked EO 13834 and instructed agencies, including the DoD, to propose new targets related to reducing greenhouse gas emissions, increasing the purchase of carbon-pollution-free electricity, increasing energy and water efficiency, minimizing waste, acquiring zero emission fleet vehicles, and pursuing additional strategies related to federal sustainability. The DoD is preparing a variety of plans, including a carbon-pollution-free electricity strategic plan, a zero emission fleet strategic plan, and a buildings strategic plan, which will establish interim targets for WHS to contribute to the DoD's achievement of the EO 14057 goals. These plans will drive WHS's efforts related to sustainability, decarbonization, and climate resilience.

EO 14057 goals must be achieved at the agency level (e.g., DoD). WHS-specific long-term and interim targets are still pending finalization of the DoD's carbon-pollution-free electricity strategic plan, zero emission fleet strategic plan, and buildings strategic plan.

By implementing the projects in the Master Plan Update, WHS is progressing towards meeting these targets:

- » 100 percent carbon-pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon-pollution-free electricity;
- » 100 percent ZEV acquisitions by 2035, including 100 percent zero emission light-duty vehicle acquisitions by 2027;
- » Net-zero emissions building portfolio by 2045, including a 50 percent emissions reduction by 2032;
- » 65 percent reduction in scope 1 and 2 GHG emissions from federal operations by 2030 from 2008 levels;
- » 50 percent diversion of non-hazardous municipal solid waste and construction and demolition waste by FY 2025, and 75 percent diversion by FY 2030;
- » Net-zero emissions from federal procurement, including a Buy Clean policy to promote use of construction materials with lower embodied emissions;
- » Climate-resilient infrastructure and operations; and
- » A climate- and sustainability-focused federal workforce.

3.7.1 SUSTAINABILITY STRATEGIES

The master plan team has identified sustainable building and stormwater management strategies to enable WHS to progress towards meeting the targets established based on the regulations, federal mandates, and other drivers discussed in [Section 2.8](#). The Master Plan Revision focuses on projects that implement BMP and sustainable stormwater management strategies, such as the installation of green infrastructure, that comply with regulations and reduce the negative impact on waterways within the Chesapeake Bay watershed.

The master plan also identifies initiatives that enable WHS to comply with EOs 14008 and 14057 which outline directives aimed at addressing climate change considerations.

SUSTAINABLE BUILDING PRACTICES

In an effort to implement sustainable design and environmental efficiency practices into new development, WHS has adopted a policy to pursue LEED certification and ensure compliance with the Guiding Principles for Sustainable Federal Buildings for all applicable new construction projects. This ensures that new buildings on the Pentagon site are designed and constructed to maximize energy and water efficiency while taking into consideration sustainable material procurement, indoor air quality, occupant health, and climate resilience. For LEED certification, the rating must be Silver or better. WHS will also construct all applicable new buildings to align with EO 14057 and resulting guidance, which prohibits scope 1 GHG emissions for new construction and requires new buildings greater than 25,000 SF to achieve net zero emissions by 2030.

STORMWATER MANAGEMENT

Applicable land-disturbing projects at the Pentagon must comply with Arlington County's post-construction stormwater management regulations, which require water quality improvements. Outside of regulated land-disturbing projects, the Pentagon must also comply with its Chesapeake Bay TMDL pollutant-reduction requirements as outlined in its MS4 permit. The Pentagon's Chesapeake Bay TMDL Action Plan is updated annually and outlines the progress made towards achieving TMDL pollutant-load reductions and the methods by which the Pentagon has planned to achieve the remaining reductions.

BMPs that improve water quality are often referred to as green infrastructure or low-impact development. See the BMP techniques in this section for further information about green infrastructure.

South Parking Lot Improvements

This project, carried over from the previous Master Plan Update, is subject to the Virginia Stormwater Management Act (VSMA) and Section 438 of the Energy Independence and Security Act (EISA) of 2007 due to the scale of the planned development. As part of the south parking improvements project, stormwater management measures will be incorporated into the design (see **Figure 3-10**). However, the types of BMPs that can be used for the south parking improvements project to meet permitting requirements are limited, as is the case with other similar projects involving large disturbed areas. If there is remaining treatment volume after land conversion analysis, approved BMPs must be selected to meet permitting requirements. BMP selection for the south parking improvements project will require a project specific in-depth engineering evaluation of geology, topography, and existing infrastructure to be performed during project design.

Previous Pentagon campuswide studies indicated that the predominant nature of the soils is type C and type D (fine particle clays and sandy clays) which infiltrate very poorly and were used for fill material. The shallow elevations of existing storm sewer infrastructure in many locations also reduce BMP options. The selective use of vegetated filter strips, dry swales, bioretention, and other appropriate methodologies offer green alternative BMP solutions, if adjacent land areas can be graded to provide the necessary open area. Vegetative roofs, infiltration technologies in type A/B soils, and rainwater harvesting are several additional technologies to fully achieve the EISA Section 438 requirements. Vegetated roofs will be investigated for all new projects. Geotechnical investigations will be conducted to confirm the impervious soils investigation results (type C and Type D predominance).

North Parking Lot Improvements

As noted in the previous master plan update, stormwater management improvements are also planned in the North Parking Lot to increase stormwater management in compliance with the VSMA and Section 438 of EISA. Modifications to the North Parking Lot have similar challenges to those described in the South Parking Lot. The primary difference is the impact of both high water table conditions and more stringent existing hydraulic grade conditions. Additional geotechnical investigations may define areas where infiltration technologies can be used or where existing elevations of surface and ground water allow for additional strategies that require separation from groundwater to be used. As described in the South Parking Lot Improvements above, specific BMPs will be explored via an in-depth engineering evaluation during the project design.

Chesapeake Bay TMDL Projects

The Chesapeake Bay TMDL projects will implement water quality improvement measures in order to meet TMDL pollutant load reduction requirements associated with the Pentagon's MS4 permit. The projects are being implemented because the total necessary pollutant reductions are not achieved through the implementation of stormwater management requirements associated with other master plan projects. A LID reference manual was prepared by WHS in June 2012 addressing LID improvements to stormwater management and treatment on the Pentagon site grounds. The list of projects and TMDL action plan are complete, and further design work and construction award are in progress. The exact location and type of stormwater quality improvement projects will be determined after further study during the detailed design process and completion of the TMDL action plan, and could be in multiple locations throughout the Pentagon campus. The following sections identify several initial projects planned to address TMDL compliance on the Pentagon campus grounds.

SOUTH SECURE PARKING

As part of the effort to address stormwater management for the south parking lot improvements, the south secure parking area will be redesigned to include the implementation of bioretention areas along the pedestrian walkways, as well as tree box filters near Corridor 2 and Corridor 3 entrances. The project will also aim to optimize parking, resulting in the net gain of 11 additional parking spaces to the area. The image to the right shows the proposed concept for the South Secure Parking area redesign.



Future Bioretentions at South Secure Parking

TREE BOX FILTERS

As part of parking lot improvements, one of the BMP measures planned is the installation of several Filterra® tree box filters (see image at right) within the North Secure Parking, the Hayes, Fern, and Eads Streets parking lots, and the Connector Lot.



Proposed Filterra® Tree Box Filters



Current Tree Box Filter in Slug Lane, Southeast Parking



North Parking Bioretention

NORTH PARKING BIORETENTION

A separate BMP effort for the north parking lot improvements is the implementation of approximately 14 bioretention locations cutting across the north parking lot. The image to the left shows the proposed concept for the bioretention areas.



Old East Loading Dock

OLD EAST LOADING DOCK

The old east loading dock currently houses the K-9 kennel building. Demolition is planned for the existing K-9 kennel building, supporting utilities, and existing containment area and implementation of a bioretention area. Additional improvements as part of this effort include the replacement of damaged storm sewer structures. There are no anticipated parking impacts as part of this project. The image to the left shows the proposed concept plan for the east loading dock.



Corridor 5 Parking

CORRIDOR 5 PARKING

The existing old helipad near the Corridor 5 parking will be demolished to expand the parking lot. The expanded parking lot will have three bioretention areas, and the lot will be regraded to ensure proper drainage. Other improvements to the Corridor 5 parking lot include the installation of emergency call boxes and LED lighting. This project is anticipated to add 24 new additional parking spaces. The image to the left shows the proposed conditions.

BMP TECHNIQUES

The master plan team coordinated with the WHS ESB group in developing BMP recommendations. Many of the original recommendations from the WHS BMP reference manual have been incorporated into the Master Plan Revision, and others are added as part of the new projects included in the plan. BMP projects included in this section are representative of the variety of measures feasible at sites within the Pentagon site. The list is not exhaustive; other BMP measures could be incorporated in the design of new projects whenever and wherever possible and as feasible based on site constraints, project budgets, and other considerations. In addition, BMPs will comply with the Pentagon's MS4 permit and the design standards and specifications of BMPs approved for use in Virginia by VDEQ to control the quality and/or quantity of stormwater runoff.

BMP MEASURES

Examples of BMP measures that have been found to be viable at the Pentagon include the following:

Bioretention uses mulch, soils, and plants to remove pollutants such as nitrogen, phosphorus, heavy metals, oil, and grease from stormwater runoff. These systems collect and filter runoff before it is infiltrated into the ground below or discharged into a traditional stormwater sewer system.

Vegetated Swales/Filter Strips are open channels used to transport stormwater runoff. They are often used in place of, or in addition to, storm sewers. The plants slow the flow of water down and remove pollutants before infiltrating into the soil below.

Stormwater Planters are small, contained planting areas that collect and treat stormwater runoff using bioretention. The plants typically used are native, water-loving flowers, grasses, shrubs, and trees. Stormwater planters do not require a lot of space, and provide aesthetic appeal and wildlife habitat and are often used in urban settings along city streets and commercial areas.



Bioretention Area



Vegetated Roof



Permeable Pavers



Native Planting

Native Landscaping uses plants that are indigenous to the local area or region. Native plants are tolerant of the area's climate and growing conditions. They usually require less maintenance and fertilizer to grow, and they provide food and habitat for wildlife like birds and butterflies. However, monoculture should be avoided. (Note that a low-maintenance grass/lawn seed that is appropriate for this climatic zone is recommended in areas close in to the Pentagon building, designated as zones 1, 2A, 2B, and 3A per the Exterior Design Standards, in accordance with the original historic design intent.)

Tree Box Filters are mini bioretention areas installed beneath trees that help control stormwater runoff. The runoff is directed to the tree box, where it is filtered by vegetation and soil before entering a catch basin. The filters usually include an engineered medium which also treats runoff. The runoff collected in the tree-boxes also helps irrigate the trees.

Vegetated Riparian Buffers are planted areas next to bodies of water that protect water resources from nonpoint source pollution, such as fertilizer and parking lot runoff, and provide bank stabilization and aquatic and wildlife habitat.

Vegetated Roofs use plants to reduce and filter runoff, insulate the building below, reduce the temperature of the surrounding area (also known as the heat island effect), reduce building waste, and prolong the lifetime of the roof. Two types of vegetated roofs are available: extensive and intensive. Extensive vegetated roofs use a thin layer of soil, up to 6 inches, to grow small, drought-tolerant plants. These vegetated roofs are usually used to gain the benefits of the vegetated roof and are not intended for people to observe them other than from a window above. Intensive vegetated roofs have a deeper soil depth that may be 24 inches, or more, and can grow larger plants and grasses. These types of vegetated roofs are usually designed for people to enjoy, in addition to the environmental and economic benefits they provide.



Swales Used to Transport Stormwater Runoff

3.7.2 OVERALL GREENING

The Master Plan Revision calls for additional greening on the Pentagon campus, including areas landscaped with native species and tree-lined roadways. Overall, green space on the campus will increase by 7.5 percent from 79 acres to 85 acres. WHS will continue to investigate improvements to green space, including new plantings. Additional trees will be subject to security considerations. The presence of any invasive, exotic species may necessitate removal of some plant material to reduce this problem on the campus grounds.

Since 2014, some projects that have begun construction (i.e., North Village ACP, Control Tower and Fire Day Station, and Pentagon COR8 Pedestrian ACP) have resulted in the removal of trees on the interior of the Pentagon site; however, tree removal has been minimal. Most trees removed were nonnative and ornamental and were typically replaced with native vegetation, and the overall number of trees on the interior of the Pentagon site has decreased only by a minor amount. No other projects are expected to result in tree removal, and any trees removed would be replaced with like-kind or native vegetation when possible. Additionally, WHS has made an effort to increase the overall number of trees on the Pentagon site through plantings of young, native trees in the riparian area. Specifically, from 2017 to 2020, WHS increased the extent of the riparian forest from 110,768 SF to 147,984 SF. In 2020, Arlington County also planted approximately 425 trees and 50 shrubs in the riparian area. Since 2019 there have been 10 acres of riverfront restoration completed. Planned green infrastructure through 2028 includes 29 bioretention areas (approximately 70,000 SF), 31 tree box filters, and 0.16 acres of vegetated roof on the Control Tower/Fire Day station.

3.7.3 CLIMATE CHANGE

The potential change in climatic conditions resulting from GHG emissions from the combustion of fossil fuels has global implications and requires that emissions be assessed at a local scale. By implementing the Master Plan Revision projects, the Pentagon will reduce its carbon footprint through a variety of measures. Implementation of master plan projects such as UESC projects will help to improve the Pentagon campus's energy efficiency, reduce GHG emissions, and improve air quality. The increased greening of the campus will increase the capacity for carbon sequestration. The implementation of TMP measures to reduce single-occupancy vehicles and the parking space reductions will decrease the number of vehicles traveling to the Pentagon campus and thus reduce overall carbon dioxide (CO₂) emissions generated by Pentagon personnel and help to improve air quality.

It should be noted that in the short-term, there will be temporary negligible increases in GHG emissions from construction activities related to the master plan projects. In the long-term, however, the overall carbon reductions should be achieved as described above. In addition, WHS is utilizing currently available data and working with other federal and regional partners to take appropriate climate mitigation planning actions.

3.8 ENERGY PROJECTS

As noted in [Section 2.9](#), the Pentagon is actively seeking to meet the goals and objectives of the Pentagon IEP adopted at the end of FY 2019. The Pentagon is moving ahead in all four Goal Areas: Energy Resilience, Energy Efficiency Alternative and Renewable Energy and Transportation Energy. While the IEP contains numerous projects, not all projects are discussed herein. Projects that are excluded are generally in the very early planning stages such as photovoltaic systems. The Pentagon is initiating feasibility investigations related to the installation of large-scale photovoltaic systems at the Pentagon. The primary focus of these investigations will be on life cycle cost analysis, environmental impacts and impacts upon the anti-terrorism force protection posture of the Pentagon. The Pentagon will continue to investigate sustainable and resilient energy opportunities such as photovoltaic systems.

The projects that are included in this update are being implemented under a variety of funding and delivery programs including the Energy Resilience and Conservation Investment Program (ERCIP). [Table 3-12](#) below lists IEP projects included in this plan.

Table 3-12 Master Plan Revision Energy Projects

#	Energy
N/A	REDACTED
2	Chiller Plant Upgrades
3	Thermal Energy Storage
4	Pilot Electric Vehicle (EV) Charge Stations
5	Pentagon-Wide Zero Emission Vehicle (ZEV) Fleet Infrastructure
6	Project Recommissioning/HVAC Efficiency Upgrade

ENERGY PROJECTS

The following energy projects are planned to achieve the goals of the IEP. All projects will be implemented according to applicable regulations and policy. Additional detail on these projects is available in the IEP.

1. REDACTED

2. Chiller Plant Upgrades - Implemented in three phases, this project will replace three additional chillers in the first phase. The second phase will implement chiller optimization controls. Phase three will either retrofit or replace the remaining six chillers. The first and second phases of the upgrade plans are part of the UESC project (discussed on p. 3-60).

3. Thermal Energy Storage - Chilled water thermal energy storage (TES) will be implemented to utilize off-peak electricity savings as well as achieve efficiencies through overnight operations. The location of the TES is proposed for land in the vicinity of the existing I-395/Boundary Channel Drive clover leaf interchange. The height and appearance of the TES tank at this location will require approval from NCPC, CFA, SHPO, and the Federal Aviation Administration (FAA).

4. Pilot EV Charge Stations - The Pentagon is planning to implement zero emissions infrastructure for its vehicle fleet in keeping with the Federal Sustainability Plan (E.O. 14057). This program begins with a pilot project for EV charging stations located in the North Secure Parking Area, which has completed the first phase and is in the design of the second phase. The first phase includes the following features:

- » Three dual-port solar-powered electric vehicle charging stations that are off-grid and grid-independent
- » Each charging station is equipped with a 4.3 kW solar panel and a 43 kWh boost battery.

The second phase, currently in design, is being funded by unspecified minor military construction funds and includes the following features:

- » Ten Level 2 dual-port charging stations with the ability to simultaneously charge 20 vehicles.
- » Each charging station will be grid-connected and rated for 12.5 kW output.

Funding for this project comes from unspecified minor military construction (UMMC) funds. Ten dual-port stations with the ability to charge 20 vehicles will be constructed.

5. Pentagon-Wide ZEV Fleet Infrastructure - The long-term vision is to realize the necessary infrastructure for a Pentagon-wide ZEV fleet. This would include upgraded Level 3 direct current fast charging (DCFC) stations at the pilot location as well as four additional locations: two in the North Parking area and two in the South Parking area.

6. Project Recommissioning/HVAC Efficiency Upgrades - Recommissioning is the process of identifying mechanical failures or other inefficiencies in HVAC systems and correcting them to optimize equipment performance. WHS is working on several key recommissioning initiatives, such as AHU recommissioning and IT equipment humidity and temperature optimization. Descriptions of the types of projects being pursued are as follows:

- » **AHU Recommissioning** - WHS is retrofitting units such as the AHU that serves the Pentagon's auditorium to assure comfort in the space while also incorporating energy-saving measures. Retrofitting projects will include upgrades like installing variable frequency drives (VFDs). In 2021, WHS identified and repaired hundreds of deficiencies identified by the building automation system (BAS) to improve energy performance.
- » **IT Equipment Humidity and Temperature Optimization** - Until recently, Pentagon and Mark Center telecommunication closets (TCs) and consolidated server rooms (CSRs) were following outdated control practices. Through the recommissioning effort, humidity and temperature control ranges were widened to comply with the latest American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) standards.

MARK CENTER

The Mark Center short-term energy projects listed in **Table 3-13** below satisfy at least one of the identified goals in the areas of energy resilience, energy efficiency, alternative energy, transportation energy, water efficiency, and cybersecurity.

Table 3-13 Master Plan Revision Energy Projects for the Mark Center

#	Energy
N/A	REDACTED
2	FRCS Modernization
3	LED Lighting Upgrades
4	EV Charging Stations and Infrastructure
5	Optimize Data Center Performance
6	Variable Speed Primary Hot Water Pumping

Note: All projects are anticipated to be completed in the short-term (0-5 years).

Source: Final Washington Headquarters Services Installation Energy Plan – Mark Center Campus, Version 2, September 8, 2022.

MARK CENTER IEP ENERGY PROJECTS

The following are summaries of the energy projects identified in the Final Washington Headquarters Services Installation Energy Plan – Mark Center Campus (Version 2, September 8, 2022). Additional details regarding the identified energy objectives and goals and the individual projects can be found in the Mark Center IEP.

1. REDACTED

2. FRCS Modernization – The FRCS modernization project will integrate existing networks at the Mark Center, which are the BAS, supervisory control and data acquisition (SCADA), elevator, escalator, and fire safety systems. It will also replace outdated Delta controllers, install fiber-optic cables, and install an HMI. Additionally, the project will improve energy efficiency of existing systems and equipment by allowing robust control sequences to be programmed.

3. LED Lighting Upgrades – Currently, the Mark Center is still using fluorescent tubes for several of their lighting fixtures, along with halogen and compact fluorescent light (CFL) bulbs that are scattered around the campus and used for accent lighting. About a third of the fixtures are LED but still would benefit from being replaced with newer, more efficient, better-quality LEDs. The lighting upgrade project will replace approximately 14,000 fluorescent, halogen, and CFL fixtures and 6,000 outdated LED fixtures with current industry-standard LEDs. Implementing these upgrades will bring the Mark Center up to date with current lighting technologies.

4. Electric Vehicle Charging Stations and Infrastructure – The Mark Center already has eight Level 2 EV charging stations on site. However, four of the charging stations are reserved for WHS use while the other four are solely for the PFFA. The prospect of additional charging stations is dependent on the Mark Center's fleet transition towards EVs and the possible need for higher capacity charging stations. The project would result in allowing the installation fleet managers to acquire additional zero emission vehicles without worrying about “refueling” capability.

5. Optimize Data Center Performance – This project will implement modifications suggested by a computational fluid dynamic air flow model completed by the Defense Information Systems Agency (DISA). The modifications will optimize the current data center to meet existing industry best practices without major renovations, saving an estimated 591,000 kWh each year.

6. Variable Speed Primary Hot Water Pumping – Each of the central plant's six boilers is equipped with a 5 horsepower (HP) primary pump that pumps heating water from the return loop and through the individual boiler. Each primary pump is constant speed and runs whenever its respective boiler operates. This project will convert each constant-speed primary pump to variable speed and program pump speed to run proportionally to boiler load. With an estimated energy savings of 40,000 kWh, this project will save an estimated \$3,000 annually. Additionally, this measure should prolong motor life by reducing the pump speed during periods of low loading.

UESC PROJECTS

The following projects comprise the six Phase 1 energy conservation measures (ECMs) that were identified by Dominion Energy (the Utility) and Energy Systems Group (ESG) to improve facilities and energy resilience on the Pentagon site. Project descriptions below were extracted from the Phase 1 Feasibility Study prepared by Dominion Energy and ESG. Descriptions have been simplified for this document.

Table 3-14 Master Plan Revision Energy UESC Projects

#	Energy
1	Lighting Improvements
2	Domestic Water Improvements
3	Chilled Water Plan Improvements
4	Building Envelope Weatherization
5	Irrigation Improvements
6	Refrigeration Improvements

UESC PROJECTS

1. Lighting Improvements – The Utility audited lighting fixtures for both interior and exterior spaces on the Pentagon campus. The audit identified the predominate lighting fixture types (90 percent) are fluorescent lamp fixtures. Most of these are connected to the BAS which keeps all lights on from 6:00 a.m. to 6:00 p.m., Monday through Friday. The Utility determined, through data logging of the fixture run times, that not all fixtures are following that schedule.

The Utility proposes to replace existing linear fluorescent (LF), compact fluorescent lamp (CFL), high-intensity discharge (HID), high pressure sodium (HPS), and metal halide (MH) fixtures, with new LED fixtures and UFC-compliant luminaire conversion kits. All luminaire conversion kits will meet the UFC 120-lumens-per-watt requirement.

The Pentagon has strict guidance on post-installation light levels that supersede both UFC and Illuminating Engineering Society (IES) guidelines and recommendations in some instances. Existing fixture locations dictate the lighting patterns and restrict redesign efforts. The Utility conducted a mockup that confirmed solutions will meet the Pentagon light level and uniformity ratio criteria. Acceptance of the mockup constitutes acceptance under the Pentagon's guidance parameters. The photometric results of the mockup were approved by the Pentagon Building Management Office (PBMO). Additionally, all components for the conversion kits meet Institute of Electrical and Electronics Engineers (IEEE) 1789-2015 in the UFC nonflicker requirements.

The Utility has specified new LED fixtures and conversion kit technology, based on a one-for-one replacement strategy, that meet the Pentagon criteria for light levels and uniformity ratios.

At the conclusion of this UESC project, the Utility will provide 2 percent of material as surplus parts. These spares will be stored on site in a location to be determined and used to supplement any warranty claims.

2. Domestic Water Improvements – This ECM will reduce domestic water consumption on the Pentagon campus. The Utility completed an extensive audit of all facilities and took measurements of water closets, urinals, bathroom faucets/aerators, and showerheads to develop baselines and proposed conditions. The fixtures were installed from 2001 to 2013. Population data were provided by the PFFA and to determine an average domestic water use for the facilities. The Utility will perform the modifications on the following fixtures to reduce water consumption.

- » Water closets
- » Urinals
- » Bathroom faucets/aerators
- » Showerheads

3. Chilled Water Plant Improvements – The HRP has nine centrifugal chillers that have been in operation for 25 years. During 2019 and 2020, a new ERCIP-funded chiller was added to the plant. Two existing free cooling heat exchangers, HX-8 and HX-10, piped in parallel with chillers 8 and 10 evaporators, exchange heat with the condenser water loop during winter operation. The condenser water system pumps river water from the Pentagon Lagoon for cooling. The increase in river water temperature to 92°F over the last several decades versus the original design of 82°F reduces chiller capacity by 18.2 percent and chiller efficiency by 10.6 percent. To address the need for additional chiller capacity, the Utility proposes the following modifications:

Remove three existing York OM chillers (CH-4, CH-5, and CH-6) and replace with three new York YD 4,000-ton, water-cooled, centrifugal chillers, operating with R134A refrigerant. These chillers will be similar in design and size to ERCIP CH-3. The new CH-4 will be supplied with a floor-mounted VFD for each compressor (to be located in electrical room 141). CH-5 and CH-6 will be supplied with a floor-mounted, reduced-voltage, solid-state starter, and power factor correction capacitor for each compressor. These starters and capacitor banks will both be located adjacent to their respective chillers.

4. Building Envelope Weatherization – The Utility performed a campuswide building envelope audit at the following areas to determine their condition and calculate energy losses:

- » Main Pentagon Building
- » Pentagon Emergency Response Center (PERC)
- » Pentagon Library and Conference Center (PLCC)

REDACTED

- » Mobile Office Complex (MOC)
- » Secondary Mobile Office Complex (SMOC)

The audit revealed that most buildings are in good condition but could benefit from improvements to decrease air infiltration/exfiltration and reduce energy loss. Door systems were found to be a large area of air infiltration/exfiltration. Most entrance doors need weather stripping and door sweeps. Over time, door seals lose their flexibility and do not function reliably. Numerous penetrations were observed that need to be sealed. In addition, due to high positive building pressure, double doors and garage doors located in the maintenance drive under the Pentagon are left open for an extended period of time.

To address these deficiencies, the Utility will perform the following modifications:

- » Repair or replace worn or missing weatherization materials on exterior and interior entry doors and garage doors. Improvements include new weather stripping, new door astragals, new door sweeps, new entry doors, and new garage doors.
- » Install weather stripping on 199 doors.
- » Replace 142 door sweeps.
- » Install 15 new entry doors.
- » Install 7 high-speed doors.

5. Irrigation Improvements – The irrigation system consists of various Toro Sentinel models. These irrigation controllers use a manual “time based” irrigation method that requires the operators to proactively manage and change the program settings at each individual system unit. The irrigation system consists of 16 systems, 13 of these being supplied by domestic water, and 3 being supplied by Boundary Channel river water.

Proposed modifications:

- » Retrofit the existing irrigation systems to be controlled using a Baseline brand, centrally controlled, weather-smart irrigation software, plus moisture sensors. A uniform, moisture-based, smart control system will automate irrigation based on climate and soil conditions.
- » Program each station or system for plant material type, soil types, and other conditions that will sync with weather data and irrigate based on plant moisture requirements.
- » Connect all controllers to the central ICONICS system so that all irrigation systems can be managed using the smart irrigation software. Category (CAT)-5 network drops from each controller to network connection points are already installed to connect the new controllers.
- » Install master valves and flow meters to measure and monitor water use of each system.

Note: The 9/11 Memorial is already scheduled to replace its controller with the proposed controller listed in this proposal. It will be able to be integrated into the smart irrigation system being proposed as part of this project.

6. Refrigeration Improvements – This ECM involves correcting operating deficiencies on refrigeration equipment located throughout the Pentagon. The units include walk-in coolers and walk-in freezers. Existing condition assessments for each component of this project are as follows:

- » **Refrigerator and Freezer Temperatures:** The Utility observed refrigerator operating temperatures varying between 30°F and 40°F, while freezer operating temperatures range between -20°F and 10°F. The average refrigerator maintains an interior temperature of 37.5°F, while the freezers average -3.6°F.
- » **Weather Stripping and Gaskets:** Numerous doors have damaged or missing weather stripping along the threshold of the door. Additionally, there are improperly fitting or damaged gasket seals.
- » **Cooler Lighting:** Lighting throughout the coolers was found to be predominantly two-lamp T5 linear fluorescent fixtures. Specialty refrigerators, such as the reach-in units, utilize T8 lamps. The RDF was installed with T12 fixtures. Lighting was on in every unit observed at all times of the day.
- » **Door Heaters:** The coolers contain electric heater wire around the door openings. Electric heaters currently run 8,760 hours per year and prevent any buildup of ice due to trapped moisture on the gasket that would prevent the door from opening easily.
- » **Evaporator Fans:** Many of the walk-in units currently have permanent split capacitor (PSC) motors running the evaporator fans. PSC motors only have two modes of operation: on or off. Currently, all evaporator fan motors run at all times, whether or not the unit is calling for cooling.

The Utility will perform the following modifications in 49 walk-in coolers and freezers:

- » **Refrigerator and Freezer Temperatures:** Reset temperatures to 38°F for refrigerators and 0°F for freezers. This will provide appropriate storage temperatures for both short-term and long-term storage of perishable foods. The Food and Drug Administration (FDA) recommends that food be stored at 40°F and 0°F for refrigerators and freezers, respectively.
- » **Weather Stripping and Gaskets:** Install new door threshold weather stripping and replace gasket seals.
- » **Cooler Lighting:** Replace existing walk-in unit lighting with 4-foot vapor tight LED fixtures and LED lamps, where applicable. Replace reach-in T8 linear fluorescent lighting with 4-foot LED lamps.
- » **Door Heaters:** Install a humidity sensor control that monitors the conditions inside and outside of the cooler and reduces the runtime of the heater. The sensor will determine the amount of moisture in the air and operate the door heater just enough to prohibit freezing.
- » **Evaporator Fans:** Replace PSC motors with EC motors, which operate more efficiently. Install a fan control unit to turn fans off when the compressor is off or to reduce the fan speed.

3.9 PROJECT PHASING

The Master Plan Revision improvements are intended to be implemented over a 20-year time frame. Planned projects are distributed among two phases of development: short-term (0-5 years) and long-term (6-20 years). Currently, 50 projects are deemed short-term, falling within the next 5 years. Of these, one project is already underway: the Pentagon Sentry program project CVIF. Eight projects are identified in the long-term phase.

The planned projects and their associated time frames are listed in [Table 3-15](#) through [Table 3-19](#) and illustrated in [Figure 3-16](#).

Table 3-15 Project Phasing: Security and Safety

Table 3-16 Project Phasing: New Facility and Land Use Changes

#	New Facility and Land Use Changes	Land Use Change	Shown on Map	Short-Term or Long-Term
1	North Village and PSOC Green/Support Space	Yes	Yes	Long-Term
2	Center Courtyard Stage and Stairs	No	Yes	Short-Term
3	Control Tower and Fire Day Station	No	Yes	Short-Term
4	Army-Navy Drive Offsite Parking Lots	Yes	Yes	Long-Term
N/A	REDACTED	REDACTED	REDACTED	REDACTED

Table 3-17 Project Phasing: Circulation

#	Circulation	Shown on Map	Short-Term or Long-Term
1	Pentagon South Pedestrian Safety Project	Yes	Short-Term
2	Southeast Parking Project	Yes	Short-Term
3	North Parking Lot Improvements	Yes	Short-Term
4	Connector Road Bridge Upgrades	Yes	Short-Term
5	Connector Road and Boundary Channel Drive Intersection Improvements	Yes	Short-Term
6	Areawide Resurfacing and Rehabilitation	No	Short-Term
7	Areawide Sidewalk Improvements	No	Short-Term
8	Metro Entrance Pedestrian ACP	Yes	Short-Term
9	Pentagon Corridor 8 (COR8) Pedestrian ACP	Yes	Short-Term
10	Remote Delivery Facility Roof Project	Yes	Short-Term

Table 3-18 Project Phasing: Environment and Sustainability

#	Environment and Sustainability	Shown on Map	Short-Term or Long-Term
1	South Secure Parking	Yes	Short-Term
2	Tree Box Filters	Yes	Short-Term
3	North Parking Bioretention	Yes	Short-Term
4	Old East Loading Dock	Yes	Short-Term
5	Corridor 5 Parking	Yes	Short-Term

Table 3-19 Project Phasing: Energy

#	Energy	Mark Center Project	UESC Project	Shown on Map	Short-Term or Long-Term
N/A	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2	Chiller Plant Upgrades	No	No	Yes	Long-Term
3	Thermal Energy Storage	No	No	Yes	Short-Term
4	Pilot Electric Vehicle (EV) Charge Stations	No	No	Yes	Short-Term
5	Pentagon-Wide Zero Emission Vehicle (ZEV) Fleet Infrastructure	No	No	No	Long-Term
6	Project Recommissioning/HVAC Efficiency Upgrade	No	No	No	Short-Term
N/A	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
8	Facility Related Control System (FRCS) Modernization	Yes	No	No	Short-Term
9	Light-Emitting Diode (LED) Lighting Upgrades	Yes	No	No	Short-Term
10	EV Charging Stations and Infrastructure	Yes	No	No	Short-Term
11	Optimize Data Center Performance	Yes	No	No	Short-Term
12	Variable Speed Primary Hot Water Pumping	Yes	No	No	Short-Term
13	Lighting Improvements	No	Yes	No	Short-Term
14	Domestic Water Improvements	No	Yes	No	Short-Term
15	Chilled Water Plant Improvements	No	Yes	No	Short-Term
16	Building Envelope Weatherization	No	Yes	No	Short-Term
17	Irrigation Improvements	No	Yes	No	Short-Term
18	Refrigeration Improvements	No	Yes	No	Short-Term

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Figure 3-16 Project Phasing

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NEW EFFORTS

4.1 UNIFIED FACILITIES CRITERIA COMPLIANCE

4.1.1 BACKGROUND AND PURPOSE

The DoD Washington Headquarters Services (WHS) wants to ensure that the Pentagon Master Plan is in compliance with the new UFC 2-100-01, Installation Master Planning, which was originally published on September 30, 2020, with the latest revision date of April 8, 2022. That document represents a significant new approach to master planning, enough so that an analysis of the existing master plan, with respect to that new criteria, is warranted.

The 2005 Pentagon Master Plan is considered to be the baseline, and was subsequently updated in 2016. The 2005 Master Plan addressed significant changes and requirements that had occurred at the Pentagon since the September 11, 2001 terrorist attack on the Pentagon. The 2016 update reexamined that plan to create a plan that better reflected the funding constraints of the next 20 years and reviewed new facilities that were planned to replace, or renovate, functions associated with the Pentagon.

Using a "stoplight" scorecard, the 2016 Master Plan Update was compared with UFC 2-100-01 in order to identify all new efforts required to be in compliance with UFC 2-100-01.

4.1.2 PROJECT DESCRIPTION

This project is intended to provide recommendations on how to bring the current Pentagon Master Plan into compliance with the most recent update of UFC 2-100-01. The current UFC provides five elements for a master plan:

1. Vision Plan
2. Installation Development Plan (IDP)
3. Installation Planning Standards (IPS)
4. Installation Development Program
5. Plan Summary

4.1.3 VISION PLAN

The first step in UFC 2-100-01 is to develop a vision plan.

A vision for planning differs from an overall installation mission by defining ideal development principles for maximizing the installation's long-term capabilities. The installation mission statement cites the specific responsibilities that the installation must support. Installation missions can change as U.S. military requirements change. **Figure 4-1** illustrates the elements within the vision plan based on the current UFC.

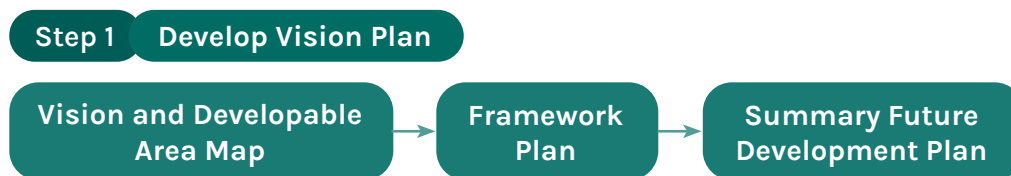


Figure 4-1 UFC Vision Plan

VISION PLAN STEPS

Installation planners and stakeholders first meet in a series of public workshops to create the vision plan. This includes all the major components listed below and in **Table 4-1**, which compares the components with the current Master Plan Update, and is further defined in the following analysis.

- » Installation Mission
- » Planning Vision and Goals
- » Constraints and Opportunities Maps
- » Developable Areas Map
- » Summary Future Development Plan

VISION PLAN ANALYSIS

The current master plan contains very few elements of the current UFC 2-100-01 vision plan requirement. A vision plan should include the following:

1. Installation Mission

The installation mission addresses the functional relationships among activities (such as support, administration, and production) and facilities, and identifies issues and opportunities for operating and developing the installation.

2. Planning Vision

The vision statement is a clear and concise description of a desired end state, and captures the essence of the entire planning effort.

3. Planning Goals

The goals of the master plan flow from the vision and focus on long-term redevelopment and construction projects necessary to fulfill mission requirements and reshape the installation.

4. Planning Objectives

The objectives define how to achieve the goals in the vision. Each objective is specific and measurable, enabling monitoring of plan implementation.

5. Constraints and Opportunities Map

This is the collection and analysis of two major types of data, on-installation data and off-installation data, that enables a full understanding of the existing landscape and holistically incorporates mission requirements into the master plan. In addition, this section also covers the following:

» On-Installation Data Collection:

- » **Mission Data** – Utilize data on current and proposed mission requirements to establish limitations and conditions that directly affect the installation's ability to execute mission support.
- » **Demographic Data** – Develop an understanding of the installation's demographics and identify appropriate principles to meet the needs of each major demographic group.

» Off-Installation Data Collection:

- » This effort includes the analysis of regional transportation systems and an assessment of community land use and federal support services as well as encroachment issues. Off-installation personnel and external environmental conditions impacting planning decisions should be examined.
- » **Developable Area Map** – Effective plans identify areas for future requirements on a developable area map. The developable area map highlights and calculates those areas that, given the identified vision, constraints, and opportunities, are open for development, and areas for future development to support growth.

6. Framework Plan

A map of the entire installation showing the area development plan (ADP) districts, key transportation and land use concepts, and other significant features that influence development patterns. The plan can also graphically represent priority ADP districts.

7. Summary Future Development Plan

The intent is not to show building footprints or other planning details, but simply to identify locations targeted for known requirements and deconflict project site selections.

Table 4-1 Vision Plan Components: UFC 2-100-01 Compliance Stoplight Scorecard

Elements (Applicable UFC 2-100-01 Section)	2016 MPU Scorecard	2016 Master Plan Update (MPU) and/or Functional Annex/Plan Element Comments
Installation Mission (Sec. 3.5.1)	Not UFC compliant (significantly deficient)	Not specifically mentioned in Update; supplemented in Section 1.1 of Master Plan Revision.
Planning Vision and Goals (Sec. 3.5.2)	Summarizes but does not further plan compliance	Not applicable to analysis (section heading); see subsections below.
Vision Statement (Sec. 3-5.3)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Executive Summary; Section 1.1; should be reevaluated after a vision statement is created.
Planning Goals (Sec. 3-5.4)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	2016 Master Plan Planning Factors; should be reevaluated after a vision statement is created.
Planning Objectives (Sec. 3-5.5)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	2016 Master Plan Planning Factors; should be reevaluated after a vision statement is created.
Constraints and Opportunities Map (Sec. 3-5.6)	Summarizes but does not further plan compliance	Not applicable to analysis (section heading); see subsections below.
On-Installation Data Collection (Sec 3.5.6.1)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Does not adequately address mission and demographic data; should include detailed constraints maps.
Off-Installation Data Collection (Sec 3.5.6.2)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Does not adequately address off-installation and environmental conditions data; should include land use maps.
Developable Area Map (Sec. 3-5.7)	Summarizes but does not further plan compliance	Not applicable to analysis (section heading); see subsections below.
Developable Area Map (Sec. 3-5.7.1)	Not UFC compliant (significantly deficient)	No developable area map is provided in the Update.
Framework Plan (Sec. 3-5.7.2)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	A majority of the framework plan is described (urban framework); however, districts were never identified.
Summary Future Development Plan (Sec. 3-5.8)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	The current plan has graphics that are close to the intent of this requirement.

VISION PLAN RECOMMENDATIONS

In order to bring the existing master plan in line with the UFC, it is recommended that the planning process begin with a new vision plan listed in the steps above. This plan can build off the existing planning factors, goals, and framework in the current master plan. However, full stakeholder involvement is required.

4.1.4 INSTALLATION DEVELOPMENT PLAN

The second step in UFC 2-100-01 is to develop an IDP.

The bulk of the installation planning effort occurs at the scale of an ADP, which is a detailed plan for a district that includes detailed constraints and opportunities maps, illustrative plans, regulating plans, implementation plans, and capacity analyses. **Figure 4-2** illustrates the elements within the IDP based on the current UFC.

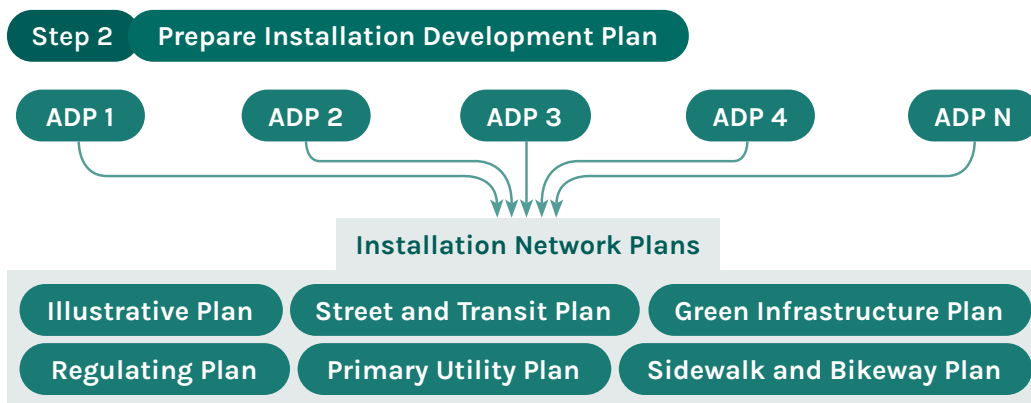


Figure 4-2 UFC IDP Graphic

IDP PLAN STEPS

The completion of the vision plan will determine how many ADPs are included in the IDP.

1. The IDP begins with completing the following for each district's ADP:

- » Regulating plans
- » Illustrative plans
- » Implementation plans
- » Supporting sketches and renderings

2. When the ADPs are completed, the overall network plans include:

- » Regulating plan
- » Illustrative plan (update, as necessary)
- » Transportation plan (update, as necessary)
- » Pedestrian and bikeway plan (update, as necessary)
- » Open space plan (update, as necessary)

IDP ANALYSIS

Although the existing plan has many aspects of the required IDP section of the UFC, it is not at the detailed ADP scale. Based on the size of the Pentagon campus, it could be argued that there is only one district. However, it could also be argued that the Pentagon campus could be broken into two or more districts based on the existing urban design framework in the current master plan. Regardless of a decision to have multiple districts, there are still missing components to the IDP:

Regulating Plan

The regulating plan includes build-to lines (BTLs), minimum and maximum building heights, key entry locations, appropriate uses, parking and roadway configurations, and any conditions for development based on the constraint's analysis.

Capacity Analysis

Effective plans identify future requirements and provide room for notional facilities and specific facilities that have not been programmed. Capacity analysis also accounts for the carrying capacity of the land and developable area on an installation. A capacity analysis should be calculated and shown on illustrative plans as "notional buildings designated for potential future growth." Calculate additional square footage of future facilities to indicate the potential capacity of an area.

Utility Plan

This includes all current and proposed primary utility lines across the installation. It forms the preferred end state for the installation's primary utility network.

Table 4-2 compares the components of an IDP to the current 2016 Master Plan Update, which are further defined in the analysis above.

Table 4-2 IDP Components: UFC 2-100-01 Compliance Stoplight Scorecard

Components (Applicable UFC 2-100-01 Section)	2016 MPU Scorecard	2016 Master Plan Update (MPU) and/or Functional Annex/Plan Element Comments
Area Development Plan (ADP) (Sec 3-6.1)	Not UFC compliant (significantly deficient)	Optional, but recommended.
ADP Analysis (Sec. 3-6.1.1)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	The Urban Design Framework identified should provide the basis for the ADP(s).
ADP Design (Sec. 3-6.1.2)	Not UFC compliant (significantly deficient)	No comments.
Developing Alternatives (Sec. 3-6.1.3)	Not UFC compliant (significantly deficient)	No comments.
Evaluating Alternatives (Sec. 3-6.1.4)	Not UFC compliant (significantly deficient)	No comments.
Designing the Preferred Alternative (Sec. 3-6.1.5)	Not UFC compliant (significantly deficient)	No comments.
Regulating Plan (Sec. 3-6.1.6)	Not UFC compliant (significantly deficient)	No comments.
Illustrative Plan (Sec. 3-6.1.7)	Substantially UFC compliant	Included at installation scale in the 2016 Master Plan Update.
Implementation Plans (Sec. 3-6.2)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Should identify sequencing of key relocation, demolition, and construction actions to move from current state to end state.
Environmental Documents (Sec. 3-6.3)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Includes CARP, IEPs, and EAs, but needs to be more integrated.
Network Plans (Sec. 3-6.4)	Summarizes but does not further plan compliance	Not applicable to analysis (section heading); see subsections below.
On-Installation Data Collection (Sec 3.5.6.1)	Substantially UFC compliant	Included at installation scale in the 2016 Master Plan Update.
Installation Regulating Plan (Sec. 3-6.4.2)	Not UFC compliant (significantly deficient)	No comments.
Installation Street and Transit Plan (Sec. 3-6.4.3)	Substantially UFC compliant	Included at installation scale in the 2016 Master Plan Update.
Installation Sidewalk and Bikeway Plan (Sec. 3-6.4.4)	Substantially UFC compliant	Included at installation scale in the 2016 Master Plan Update.
Installation Green Infrastructure Plan (Sec. 3-6.4.5)	Substantially UFC compliant	Included at installation scale in the 2016 Master Plan Update.
Installation Primary Utility Plan (Sec. 3-6.4.6)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Supplemented by Exterior Utility Master Plan, 2019.

IDP RECOMMENDATIONS

This step is partially dependent on the results of the vision plan. If multiple districts are developed, then an ADP for each district would need to be developed. However, if no vision plan is created or the result of the vision plan is a single district, then incorporating a regulating plan, capacity analysis, and utility plan into the current master plan would meet the intent of the UFC.

4.1.5 INSTALLATION PLANNING STANDARDS

The third step in UFC 2-100-01 is to develop the IPS.

The IPS provides a clear set of guidelines to ensure that the installation’s vision and planning objectives for development are achieved, even if drastic changes to missions or programs occur. **Figure 4-3** illustrates the elements within the IPS based on the current UFC.



Figure 4-3 UFC IPS

IPS ANALYSIS

While the existing master plan has a design guidelines summary and there is a Pentagon Site Exterior Standards Manual from 2016, this whole section of the master plan requirements would have to be revised. This section would have to incorporate the standards in relation to the new districts and regulating plans.

Building Envelope Standards (BES's)

Typical elements defined in each BES are massing, height, placement (e.g., required BTLs and the percentage of the building that must be built to the required BTLs), allowable parking locations, materials, and use. Also included is a general description of the building type. Each BES is coded to the regulating plan.

Street Envelope Standards (SES's)

SES's illustrate typical configurations for all street types on an installation. Each SES addresses vehicular traffic-lane widths, curb radii, sidewalk and tree planting area dimensions, and on-street parking configurations. An SES is required for every type of street specified on the installation.

Landscape Standards

Landscape standards identify the installation’s landscape theme(s), addressing both design intent and allowable plant materials and site furnishing elements.

Table 4-3 compares the components of an installation IPS to the current 2016 Master Plan Update, which are further defined in the analysis above.

Table 4-3 Installation Planning Standards Components: UFC 2-100-01 Compliance Stoplight Scorecard

Components (Applicable UFC 2-100-01 Section)	2016 MPU Scorecard	2016 Master Plan Update (MPU) and/or Functional Annex/Plan Element Comments
Building Envelope Standards (Sec. 3-7.1)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Broken into zones - not as detailed as the typical elements in the BES (Chapter 4); supplemented by the 2010 Exterior Standards Manual.
Street Envelope Standards (Sec. 3-7.2)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Has some streetscape information, mostly related to parking areas and stormwater management (Chapter 4); supplemented by the 2010 Exterior Standards Manual.
Landscape Standards (Sec 3-7.3)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Includes plant list (Appendix C); supplemented by the 2010 Exterior Standards Manual.

IPS RECOMMENDATIONS

In order to bring the current master plan into compliance, these standards would have to be redone to coordinate with the regulating plan created as part of the IDP recommendations. Information can be carried over from the current master plan and Pentagon Site Exterior Standards Manual. However, it must be revised so that it is coded to the regulating plans and updated to the criteria listed above in the analysis.

4.1.6 INSTALLATION DEVELOPMENT PROGRAM

The fourth step in UFC 2-100-01 is to develop an IDP.

The IDP is the overall strategy for using and investing in real property to support installation missions and DoD objectives. It describes permanent comprehensive/holistic solutions, as well as short-term actions necessary to correct deficiencies and meet current and future mission needs through a method that ensures infrastructure reliability and contributes to sustainable development. **Figure 4-4** illustrates the elements within the development program based on the current UFC.



Figure 4-4 UFC Installation Development Program

INSTALLATION DEVELOPMENT PROGRAM ANALYSIS

The current master plan does have recommended projects, with some analysis of requirements for the new facility projects. However, there is not an overall analysis of the existing surplus or deficits. The requirement is to have a program narrative to describe:

- » Key facility areas requiring the most attention in the near future
- » A listing of required facilities and existing surplus or deficits
- » A description of key development issues and strategies used to overcome these issues
- » All interim steps required to achieve the desired end state

Although the current master plan has project lists and is broken out by short-term, mid-term, and long-term, it lacks:

- » Funding type
- » Project numbers (PNs)
- » Fiscal year (FY)
- » Estimated program amount

The listing should address all programmed projects, as well as other known projected requirements that may not yet be programmed. If no fiscal year or program amount is known at the time, note that the project requires programming.

INSTALLATION DEVELOPMENT PROGRAM RECOMMENDATIONS

In order to meet the intent of the current UFC, this section needs to be revised. A full set of requirements across the site needs to be included, along with more detail on the programming of the projects.

Table 4-4 compares the components of the IDP to the existing 2016 Master Plan Update, which are further defined in the analysis above.

Table 4-4 Installation Development Program Components: UFC 2-100-01 Compliance Stoplight Scorecard

Element (Applicable UFC 2-100-01 Section)	2016 MPU Scorecard	2016 Master Plan Update (MPU) and/or Functional Annex/Plan Element Comments
Program Elements (Sec. 3-8.1)	Summarizes but does not further plan compliance	Not applicable to analysis (section heading); see subsections below.
Narrative (Sec. 3-8.1.1)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Should describe key development issues and strategies used to overcome these issues.
Landscape Standards (Sec 3-7.3)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Lacks funding type, project numbers, fiscal year, and program amount.
Program Development (Sec. 3-8.2)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Should also include an overall analysis of the existing surplus or deficits and assessment of conditions.

4.1.7 PLAN SUMMARY

The final step in UFC 2-100-01 is to develop an installation plan summary.

Once the planning processes and products are completed, prepare a plan summary that includes the vision plan, executive summaries of the ADPs, appropriate network plans, and a summary of the IDP. **Figure 4-5** illustrates the elements within the IDP based on the current UFC.

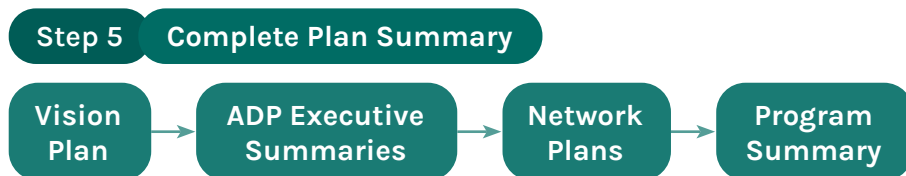


Figure 4-5 UFC Plan Summary

PLAN SUMMARY ANALYSIS

The existing master plan has an executive summary. However, a complete plan summary does not currently exist. All the sections of the existing master plan would have to be updated in order to create the plan summary.

Table 4-5 Plan Summary: UFC 2-100-01 Compliance Stoplight Scorecard

Element (Applicable UFC 2-100-01 Section)	2016 MPU Scorecard	2016 Master Plan Update (MPU) and/or Functional Annex/Plan Element Comments
Plan Summary/Digest (Sec. 3-9)	Applicable once master plan process is complete	Should be prepared once all master plan components are complete.

PLAN SUMMARY RECOMMENDATIONS

In order to meet the current UFC, this element should be redone if the other recommendations have been completed. If the vision plan and ADPs are not created, the executive summary of the current document fills this requirement.

4.2 CLIMATE ADAPTION AND RESILIENCE PLAN

4.2.1 BACKGROUND AND PURPOSE

The DoD WHS wants to ensure that the Pentagon Master Plan is in compliance with the new UFC 2-100-01, Installation Master Planning, that was published on September 30, 2020. That document represents a significant new approach to master planning, enough so that an analysis of the existing master plan, with respect to that new guidance, is warranted.

Part of UFC 2-100-01 includes guidance on functional annexes. These are documents that support the master planning process by providing inputs to planning framework and the vision plan, especially with goals and objectives for long-term development and constraints to be considered at all stages of installation planning. Functional annexes include, but are not limited to, an installation climate resilience plan (ICRP).

4.2.2 PROJECT DESCRIPTION

This project is intended to provide recommendations on how to bring the current draft Climate Adaptation and Resilience Plan (CARP) for the Pentagon (October 2017) into compliance with the new UFC 2-100-01. The current UFC requires sustainability planning be incorporated into the master plan to include planning for severe weather and climate resiliency.

4.2.3 SUSTAINABILITY PLANNING

Sustainability planning leads to lasting development—meeting present mission requirements without compromising the ability of future generations to meet their needs—by incorporating planning for severe weather and climate resiliency into master plans, ADPs, and other planning products.

UFC 2-100-01 SECTION 2-2.17 PLANNING FOR SEVERE WEATHER AND CLIMATE RESILIENCY

Identify and assess risks to the installation from the effects of extreme weather and climate change and develop plans to address and mitigate those risks. Weather is defined as the day-to-day environmental conditions at a particular locale measured in terms of temperature, atmospheric pressure, wind, and moisture. Weather phenomena are short-term occurrences, including snowfall or rain events, storm surge, thunderstorms, tornadoes, cold fronts, or heat waves. Climate change is the variation in average weather conditions for a particular locale or region that persists over several decades or longer and encompasses increases or decreases in average temperatures, shifts in precipitation, and an altered risk of certain types of weather events. Examples of climate change phenomena include sea level change, changes in precipitation or temperature patterns, storm intensity, and extreme temperatures. Each DoD location is affected differently by local weather and geography. Assess the risks related to extreme weather events and climate change phenomena applicable to a specific location as part of a severe weather and climate resiliency analysis to develop appropriate recommendations and plans for the installation.

SUSTAINABILITY RECOMMENDATIONS

The existing Master Plan includes sustainable strategies and projects. The existing draft CARP provides climate adaptation strategies and mitigation goals. Everything in these documents that relates to this section of the UFC is in compliance; however, it is recommended that as these documents are updated the recommendations remain consistent across both.

4.2.4 FUNCTIONAL ANNEXES

Functional annexes support the master planning process by providing inputs to the planning framework and the vision plan, especially with goals and objectives for long-term development and constraints to be considered at all stages of installation planning. Functional annexes identify gaps in facilities and infrastructure which are addressed in the master planning process. Functional annexes include, but are not limited to, IEPs, ICRPs, area development execution plans (ADEPs), complex plans, and project development plans (PDPs).

Table 4-6 describes the recommended plan elements and those required by 10 USC 2864 along with their current compliance status based on the above analysis.

Functional Annexes (Applicable UFC 2-100-01 Section)	2016 MPU Scorecard	2016 Master Plan Update (MPU) and/or Functional Annex/Plan Element Comments
Installation Energy Plan (Sec. 3-10.1)	Substantially UFC compliant	Required by UFC 2-100-01 to meet the requirements of 10 USC 2864; includes the Mark Center.
Installation Climate Resilience Plan (Sec. 3-10.2)	Partially UFC compliant and/or not in UFC-specified form (somewhat deficient)	Required by UFC 2-100-01 to meet the requirements of 10 USC 2865; does not include the Mark Center.
Area Development Execution Plans (Sec. 3-10.3)	Optional element/component	Should be prepared for any recommended future ADPs.
Complex Plans (Sec. 3-10.4)	Optional element/component	Optional once any future ADPs are completed.
Project Development Plan (Sec. 3-10.5)	Optional element/component	Optional once any future ADPs or campus plans are completed.

INSTALLATION CLIMATE RESILIENCE PLAN

Section 2801 of the FY 2020 NDAA amended 10 USC 2864 requires installation master plans to include an installation military resilience component to discuss severe weather and other changing environmental factors. The ICRP is used to document this resilience measure. The UFC 2-100-01 requires the ICRP to address the items shown in [Table 4-7](#). The table also notes which elements are covered in the current draft CARP.

Table 4-7 ICRP Components (UFC 2-100-01)

UFC Reference	Components	CARP Addresses
3-10.2.1	Identify existing and projected risks and threats to military installation resilience	Yes
3-10.2.1	high winds	Yes
3-10.2.1	extreme weather events	Yes
3-10.2.1	mean sea level fluctuation	Yes
3-10.2.1	wildfires	Yes
3-10.2.1	flooding	Yes
3-10.2.2	Identify installation assets or infrastructure at risk to climate or weather-hazard-related risks and threats.	Yes
3-10.2.3	Include ongoing or planned infrastructure projects to mitigate the impacts of the risks and threats.	Yes
3-10.2.4	Evaluate previous extreme weather events and application of lessons learned when determining planning constraints and validating planned infrastructure projects.	Yes
3-10.2.5	Identify community infrastructure and resources located outside the installation necessary to maintain mission capability or that impact the installation's resilience that are vulnerable to the risks and threats.	Yes
3-10.2.6	Identify agreements in effect or planned with public or private entities at the time of the development of the IDP, for the purpose of maintaining or enhancing military installation resilience or resilience of community infrastructure and resources.	Yes
3-10.2.7	Identify current coordination efforts and plans for additional coordination with public or private entities for the purpose of maintaining or enhancing military installation resilience or resilience of community infrastructure and resources described in paragraph 3-10.2.5.	Yes

ICRP RECOMMENDATIONS

While an ICRP is not formally developed in the draft CARP, the Pentagon's plan sufficiently addresses the sections needed to provide input to the master plan. UFC reference 3-10.2.7 was added in April 2022. The existing CARP does touch on existing coordination efforts; however, this section could be strengthened to include plans for additional coordination. It is recommended this plan be finalized, the formal ICRP format created, and input from this plan used in the updated master planning process.

4.2.5 NAVFAC CLIMATE CHANGE: INSTALLATION ADAPTION AND RESILIENCE PLANNING HANDBOOK

UFC 2-100-01 recommends using the Naval Facilities Engineering Systems Command (NAVFAC) Installation Adaptation and Resilience Climate Change Planning Handbook or other service-specific handbook to identify hazards and evaluate adaptation strategies applicable at the installation or district level. As a best practice, use the NAVFAC handbook to determine and evaluate adaptation strategies specific to capital improvement projects of significant scale which improve the overall resilience of the installation. **Table 4-8** below shows the elements in the NAVFAC handbook and what is addressed in the draft CARP.

Table 4-8 Installation Adaption and Resilience Planning Handbook Components

Stage	Worksheet (WS)	CARP Addresses
Stage I – Establish Scope and Characterize Impacts	WS I.1 – Assessment Scope	Yes
Stage I – Establish Scope and Characterize Impacts	WS I.2 – Site Information Quality Assessment	Yes
Stage I – Establish Scope and Characterize Impacts	WS I.3 – Historical Weather Event and Impacts Information	Yes
Stage I – Establish Scope and Characterize Impacts	WS I.4 – Climate Information Requirements and Attributes	Yes
Stage I – Establish Scope and Characterize Impacts	WS I.5 – Current and Plausible Future Conditions	Yes
Stage I – Establish Scope and Characterize Impacts	WS I.6 – Existing Assessment Evaluation	Yes
Stage I – Establish Scope and Characterize Impacts	WS I.7 – Impact Description and Characterization	Yes
Stage II – Identify and Screen Action Alternatives	WS II.1 – Potential Action Alternatives	Yes
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.1 – Life Cycle Cost Analysis (Grouping Strategy: Multiple Lines of Defense)	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.2 – Cost Effectiveness Analysis	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.3 – Benefits (Strategy Grouping: Multiple Lines of Defense)	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.4 – Benefit Cost Ratio and Net Present Value	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.4.1 – Benefit Cost Ratio and Net Present Value (Grouping Strategy: Multiple Lines of Defense)	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.4.2 – Benefit Cost Ratio and Net Present Value (Alt 1)	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.4.2 – Benefit Cost Ratio and Net Present Value (Alt 2)	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.4.4 – Benefit Cost Ratio and Net Present Value (Alt 3)	No
Stage III – Calculate Benefits and Costs Benefits of Action Alternatives	WS III.4.5 – Benefit Cost Ratio and Net Present Value (Alt 4)	No
Stage IV – Assemble Portfolio of Action Alternatives	WS IV.1 – Portfolio Summary	Yes

ICRP HANDBOOK COMPARISON RECOMMENDATIONS

While the existing draft CARP has Stages I and II handbook components, it does not follow through to Stages III and IV. It is recommended to take the information in the draft and apply it to the worksheets in the handbook and complete Stages III and IV before taking the document to final.

4.2.6 OVERALL CARP SUMMARY

The existing draft CARP meets the UFC 2-100-01, Installation Master Planning requirements for a functional annex; however, it does not follow the recommended NAVFAC Installation Adaptation and Resilience Climate Change Planning Handbook.

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4.2.7 CHRONOLOGY AND RELATIONSHIP OF INSTALLATION MASTER PLANS TO OTHER PLAN ELEMENTS AND ENVIRONMENTAL ASSESSMENTS

Figure 4-6 illustrates the current and future plan elements and environmental assessments (EAs) that make up the entirety of master planning documents.

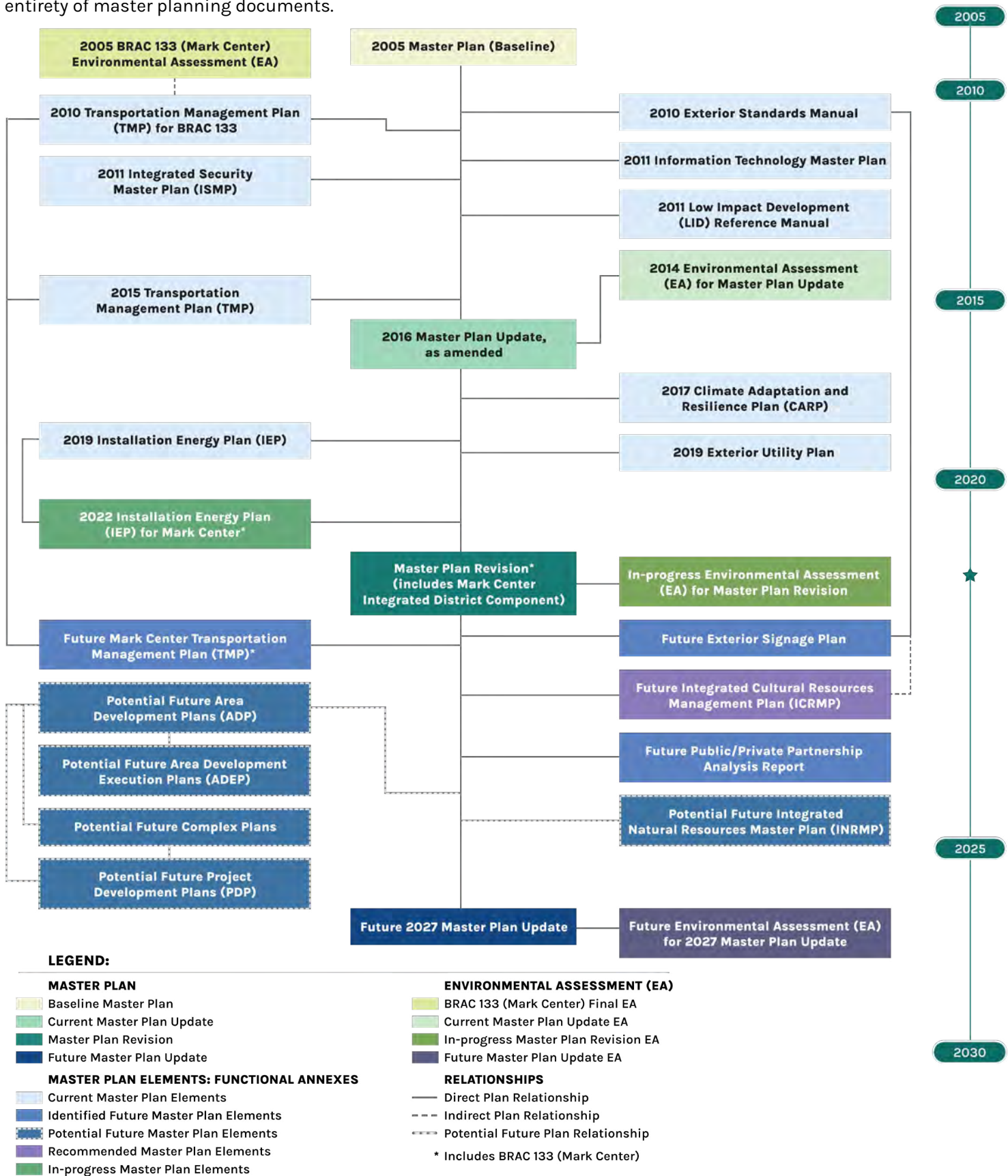


Figure 4-6 Chronology and Relationship of Installation Master Plans to Other Plan Elements and EAs

Table 4-9 Other Functional Annexes/Plan Elements (Noted in 2016 Master Plan Update)

Functional Annexes/Plan Elements (UFC 2-100-01, Section 3-10)

Area Information Technology (IT) Master Plan, 2011
Exterior Standards Manual, 2016
Integrated Security Master Plan (ISMP), 2011
Low Impact Development (LID) Plan, 2011
Transportation Management Plan (TMP) for BRAC 133 at Mark Center, 2010 (includes Mark Center)

Table 4-10 Other Functional Annexes/Plan Elements (Noted in Master Plan Revision)

Functional Annexes/Plan Elements (UFC 2-100-01, Section 3-10)

Exterior Utility Master Plan, 2019
Climate Adaptation and Resilience Plan (CARP), 2017
Transportation Management Plan (TMP), 2015
Installation Energy Plan (IEP) for the Mark Center, 2022 (includes Mark Center)

Table 4-11 Other Potential Functional Annexes/Plan Elements (Noted in Master Plan Revision)

Functional Annexes/Plan Elements (UFC 2-100-01, Section 3-10)

Integrated Cultural Resources Management Plan (ICRMP): Future
Integrated Natural Resources Management Plan (INRMP): Future
Exterior Signage Plan: Future
Public/Private Partnership Analysis Report: Future
Mark Center Transportation Management Plan (TMP) (includes Mark Center): Future
Installation Climate Resilience Plan (ICRP): Future

Table 4-12 Environmental Assessments Associated with Master Plan Updates and Revisions

Environmental Assessments

Environmental Assessment (EA) for BRAC 133 (Mark Center), 2005 (includes Mark Center)
EA for the Master Plan Update, 2014
EA for Master Plan Revision (includes Mark Center): In progress
EA for Future 2027 Master Plan Update (includes Mark Center): Future



(Prepared September 9, 2022; revised September 28, 2022)

PROJECT EXECUTIVE ORDERS (EOs)

EO 13653 Preparing the United States (U.S.) for the Impacts of Climate Change, November 1, 2013 (Amended by EO 13693, March 19, 2015; revoked by EO 13783, March 28, 2017; reinstated by EO 13990, January 20, 2021).

EO 13783 Promoting Energy Independence and Economic Growth, March 28, 2017, (Revoked by EO 13990, January 20, 2021).

EO 13990 Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, January 20, 2021.

EO 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021.

EO 14057, Catalyzing Clean Energy Industries and Jobs through Federal Sustainability, December 8, 2021.

FEDERAL ACTS, STATUTES, AND REGULATIONS

10 USC § 2674 – Operation and Control of Pentagon Site and Defense Facilities in National Capital Region, effective date December 12, 2017.

10 USC § 2864 – Master Plans for Major Military Installations, effective date January 15, 2013.

40 USC § 87 – Physical Development of National Capital Region, effective date January 4, 2011.

Department of Defense (DoD) Sustainable Buildings Policy, November 10, 2013.

Energy Act of 2020, December 27, 2020.

Energy Independence and Security Act (EISA) of 2007, December 19, 2007.

Energy Policy Act (EPAAct) of 2005, August 8, 2005.

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Arlington County, Virginia, (Map No. 51013C0081C, effective August 19, 2013).

National Historic Preservation Act of 1966 (currently codified in Title 54 of the USC).

The National Environmental Policy Act (NEPA) of 1969, as amended, January 1, 1970.

STATE, REGIONAL, AND LOCAL CODES AND REGULATIONS

9VAC25-870-63. Water Quality Design Criteria Requirements.

Chesapeake Bay Preservation Act, Article 2.5, Code of Virginia, latest amendment April 11, 2022.

City of Alexandria Zoning Ordinance Article XIII (Environmental Management) [Article XIII. Environmental Management | Zoning | Alexandria, VA | Municode Library](#).

Monumental Core Framework Plan, National Capital Planning Commission's (NCPC) and U.S. Commission of Fine Arts, 2009.

The Chesapeake Bay Preservation Ordinance of Arlington County - [Chesapeake Bay Preservation Ordinance Official Website of Arlington County Virginia Government](#).

The Comprehensive Plan for the National Capital, Federal Elements, National Capital Planning Commission, 2016.

Transportation Management Plan Handbook, National Capital Planning Commission's (NCPC), updated August 2021.

Virginia Phase III Watershed Implementation Plan (WIP III), August 23, 2019.

Virginia Stormwater Management Act (VSMA), Article 2.3, latest amendment April 20, 2016 Code of Virginia Code [Article 2.3. Stormwater Management Act](#).

DoD GUIDANCE AND INSTRUCTIONS

Considerations for DoD Implementation of Zero-Emission Vehicles and Charging Infrastructure, March 2022.

DoD 2014 Climate Change Adaptation Roadmap, June 2014.

DoDI 4170.11 Installation Energy Management, Change 1, effective March 16, 2016.

DoDI 4180.01 DoD Energy Policy, Change 2, August 31, 2018.

DoDI 4715.03 Natural Resources Conservation Program, Change 2, August 31, 2018.

DoDI 4715.21 Climate Change Adaptation and Resilience, effective January 14, 2016.

DoD Climate Adaptation Plan, September 1, 2021.

DoD Climate Risk Analysis (DCRA), October 2021.

DoD Strategic Sustainability Performance Plan FY 2010 (and subsequent years through FY 2016).

DoD Sustainability Report and Implementation Plan FY 2018 (and subsequent years through FY 2020).

Guiding Principles for Sustainable Federal Buildings (and Associated Instructions), Council on Environmental Quality, December 2020.

Installation Energy Plans, March 31, 2016.

Installation Energy Plans – Energy Resilience and Cybersecurity Update and Expansion of the Requirement to All DoD Installations, May 30, 2018.

NAVFAC Installation Adaptation & Resilience Climate Change Planning Handbook, January 2017.

DoD Sustainability Plan FY 2022.

UNIFIED FACILITIES CRITERIA (UFC) – WHOLE BUILDING DESIGN GUIDE (WBDG)

UFC 1-200-02 High Performance and Sustainable Building Requirements, with Change 2, December 1, 2020, Change 2 revision date June 1, 2022.

UFC 2-100-01 Installation Master Planning, with Change 1, September 30, 2020; Change 1 revision date April 8, 2022 .

UFC 3-210-10 Low Impact Development, with Change 3, June 1, 2015, Change 3 revision date March 1, 2020.

UFC 3-260-01 Airfield and Heliport Planning and Design, with Change 1, February 4, 2019, Change 1 revision date May 5, 2020.

UFC 3-580-01 Telecommunication Interior Infrastructure Planning and Design, with Change 1, revision date June 1, 2016.

UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings, with Change 2, revision date July 30, 2022.

UFC 4-026-01 Design to Resist Forced Entry, March 4, 2020.

PLAN DOCUMENTS AND OTHER RESOURCES

2021 DoD Utilities Meter Policy requirements.

Arlington National Cemetery Master Plan, Department of the Army, July 9, 2015.

Arlington National Cemetery Southern Expansion and Air Force Memorial Modification Project, Arlington, VA, DoD, November 5, 2020.

Assessment of Base Realignment and Closure (BRAC) 133 Final Environmental Assessment (EA), July 2008 and Transportation Management Plan of July 2010, Inspector General of the U.S., DoD, April 21, 2011.

Assistant Secretary of Defense Memorandum, Utility Meter Policy, January 14, 2021.

BRAC 133 Summary Chart, U.S. Army Corps of Engineers, March 16, 2009.

DoD BRAC 133 Office Complex – I-395 and Seminary Road, Mark Center, Alexandria, VA, Duke Realty.

Cultural Resources Investigations: Site Virginia Department of Historic Resources (VDHR) ID 44AX0028 and Site VDHR ID 000-9878.

PLAN DOCUMENTS AND OTHER RESOURCES

Draft Climate Adaptation and Resilience Plan (CARP) for the Pentagon, October 2017.

Exterior Utility Master Plan, March 29, 2019.

Final Installation Energy Plan – Mark Center Campus, Washington Headquarters Services, Version 2, September 8, 2022.

Final EA Implementation of 2005 Base Realignment and Closure Recommendation 133 (Washington Headquarters Services) Fort Belvoir, Virginia, July 2008.

General Permit for Discharges Under the Virginia Stormwater Management Act Program and the Virginia Stormwater Management Act - MS4 Permit (VAR040103), Virginia Department of Environmental Quality (VDEQ), 2013.

Installation Energy Plan – Pentagon Campus, Washington Headquarters Services, October 31, 2019.

Integrated Security Master Plan (ISMP), 2011.

Mark Center BRAC 133 Access Study, BRAC Advisory Committee, October 2010.

[Mark Center Conference Center Guide](#), no date.

[Mark Center-Pentagon Line 7M Metrobus Map and Schedule](#), effective June 17, 2012, WMATA.

[Mark Center Transit Center, City of Alexandria](#) (updated January 15, 2022).

Pentagon Area Information Technology (IT) Master Plan, 2011.

Pentagon Site Exterior Standards Manual, 2010, revised November 29, 2016.

Pentagon Reservation Master Plan, 1991.

Pentagon Reservation Master Plan, 2005.

Pentagon Reservation Master Plan Update, April 2, 2015, amended April 7, 2016.

Pentagon Reservation Master Plan Update – Pre-final EA, August 2014.

Pentagon Transportation Management Plan, April 2, 2015.

Transportation Management Plan for BRAC 133 at the Mark Center, U.S. Army Corps of Engineers, Public Review Draft, June 2, 2010.

Utility Energy Services Contract, 2016.

Washington Headquarters Services (WHS) Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan, August 2021.

Washington Headquarters Services Low Impact Development (LID) Reference Manual, June 2012.

Welcome to the Pentagon - 2021.

WHS Mark Center Transportation Management Plan, 2019 Annual Evaluation Report, U.S. DoD, December 2019 (latest in a series of reports and surveys).

Arlington County General Land Use Plan Booklet booklet_2021final-04052021.pdf ([Arlington, VA Homepage](#)), December 2021 and Map: glup_map_2021_front.pdf ([Arlington, VA Homepage](#)), February 2022.

Arlington County Pentagon City Sector Plan, September 28, 2021 PowerPoint Presentation ([Arlington, VA Homepage](#)).

The Comprehensive Plan for the National Capital - Federal Elements, National Capital Planning Commission, 2021, [NCPC Comprehensive Plan Federal Elements 2022](#).

Draft Mark Center Transportation Management Plan, HDR 2023.

PENTAGON SITE PROJECT-RELATED RESOURCES

Arlington National Cemetery South Expansion Project – Final Review Submission to the National Capital Planning Commission, November 5, 2020.

Control Tower/Fire Day Station, Pentagon Site, Arlington, VA, National Capital Planning Commission Concept Submittal, August 2, 2019.

DoD Headquarters Portfolio, Pentagon Sentry II AFG, April 13, 2021.

DoD Headquarters Portfolio, Senior Review Board, FY 2024-2028 Milcon & PRMRF Programs, March 7, 2022.

Statement of Work - Pentagon Power Islanding Analysis, revised June 13, 2022.

Washington Headquarters Services, Facilities Services Directorate (FSD), Engineering and Construction Management (ECM) Monthly Project Reporting: Pentagon Support Operations Center, March 31, 2022.

Washington Headquarters Services, FSD, ECM Monthly Project Reporting: Pilot EV Charging Stations Project, July 28, 2022.

Washington Headquarters Services, FSD, ECM Monthly Project Reporting: Sentry II Program, July 28, 2022.

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Washington Headquarters Services, FSD, Total Maximum Daily Load Compliance, Projects Overview, April 2021.

Washington Headquarters Services, Pentagon CCY Stage Design Concepts, Executive Brief, January 5, 2017.

Washington Headquarters Services, Pentagon Site Metro Access Control Point (MACP), Prefinal Charrette Report, March 4, 2022.

**APPENDIX B
NATIONAL CAPITAL PLANNING COMMISSION COMPREHENSIVE PLAN FOR THE
NATIONAL CAPITAL: FEDERAL ELEMENTS POLICIES APPLICABLE TO THE
PENTAGON MASTER PLAN**

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Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
<i>Urban Design Element</i>	
UD.C.1.2	For federal campuses and installations, agencies should address specific urban design issues through the preparation and updating of master plans. In conformance with NCPC guidelines, master plans should be updated on a regular basis, in consultation with local governments and the Commission, to respond to changing conditions and agency needs.
UD.C.1.5	For federal facilities, integrate the accessibility to transit, bicycle, and pedestrian modes into the urban design and comply with ADA and ABA requirements.
UD.C.2.2	<p>Agencies should enhance the pedestrian experience in and around federal buildings and campuses, wherever possible, and in consideration of this element’s security section. In particular:</p> <ol style="list-style-type: none"> 1. Consider flexible and impervious areas, such as plazas, to accommodate congregating and place-making activities within the design program of federal building yards. 2. Avoid blank walls where a building meets adjacent public space and activate street level facades by utilizing art displays, transparent materials, or other appropriate methods. 3. Principal facades and primary public building entrances should face major streets or open spaces. 4. Break up superblocks and introduce mid-block alleys that can either be used for community open space or shared access to service areas of multiple buildings. 5. Incorporate shared open space into new federal office developments, where possible. 6. Habitable building space should be provided along the street frontage to accommodate public space or activated ground floor uses, such as retail or other commercial enterprises, as appropriate. In particular: <ol style="list-style-type: none"> a. Concentrate retail activity near transit hubs and key intersections adjacent and accessible to public sidewalks and plazas. b. Consider establishing street markets and farmers markets on federally-owned plazas, courtyards and underused open spaces.
UD.C.2.5.	Design pedestrian and vehicular entrances, or any physical gateways to federal campuses and buildings, to be as inviting and as accessible as possible.
UD.C.3	Security is one of the main priorities of the Pentagon Master Plan. A majority of the policies under C.3 Urban Design and Security apply to the Pentagon Master Plan. Please see pages 39-43 of NCPC’s Comprehensive Plan for the National Capital: Federal Elements for the list of policies under this sub-element.
<i>Federal Workplace Element</i>	
FW.B.1	Locate, design, construct, and operate federal facilities to minimize total energy use.
FW.B.4	Encourage federal employees to use non-motorized modes and multi-occupant modes of travel including rideshare, carpools, vanpools, privately leased buses, and public transportation to get to/from work.

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
FW.B.8	Develop master plans that guide the long-range development of installations where more than one principal building, structure, or activity is located or proposed
FW.B.9	Establish the characteristics of an installation and its surroundings through the master planning process, as required by the Commission. Characteristics include qualities and resources to be protected; building groupings, massing, and architectural character; streetscape and landscape elements; and access elements to buildings and from surrounding streets and transit facilities.
FW.B.10	Encourage agencies to review master plans at least every five years to ensure that both inventory material and development proposals are current. Agencies should advise the Commission of the results of such reviews and provide NCPC with a proposed schedule for revising master plans when an update is needed. Revisions to master plans should reflect changed conditions and provide a current plan for the facility's development.
FW.B.12	Continue to monitor installation employment levels and revise master plans as necessary to reflect changed conditions. Provide an up to date plan for the installation's development
FW.B.13	Provide, or work with local jurisdictions, to develop, a variety of service uses and amenities for employees within a reasonable travel time or walking distance. Services should include restaurants, retail outlets, financial and professional services, day-care centers, and health and fitness centers, as well as public open space
FW.B.17	Make primary pedestrian entrances at federal workplaces readily ADA accessible to public transportation options, particularly Metrorail, where available. Facility entrances should be situated as close as possible to transit stops and stations where possible.
FW.B.18	Provide and maintain space for activities that encourage public access to, and stimulate public traffic around, into, and through federal facilities, including pedestrian or bicycle traffic where possible.
FW.B.22	Use appropriate commemoration and exhibits at federal workplaces. Buildings, auditoriums, plazas, courtyards, and other features can be named and embellished with plaques and sculptures. Exhibits are encouraged in widely used areas such as lobbies and corridors.
FW.B.31	Support local and regional efforts to coordinate land use with the availability or development of transportation alternatives to the private automobile, including walking, bicycle riding, and public transit (Metrorail, VRE, MARC, or other type of transit service such as streetcar or bus rapid transit) systems when locating federal workplaces.
<i>Transportation Element</i>	
T.A.8	Coordinate with regional and local agencies to develop an integrated system of bicycle and pedestrian trails that provide connections throughout the region, including to and from federal destinations.
T.A.11	Support the maintenance and improvement of existing transportation infrastructure, with a priority on multimodal transportation corridors that support transit, pedestrian, and bicycle use.

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
T.A.12	Support efforts to prioritize transportation funding towards maintenance of federal infrastructure that function as part of the regional commuter system.
T.B.2	Work with local jurisdictions to ensure that there is adequate infrastructure for bicycles and pedestrians to safely and efficiently travel to and from federal destinations, including usable sidewalks, enough lighting, protected bike lanes, and multiuse trails, as appropriate.
T.B.3	Provide secure bicycle parking spaces or bicycle lockers in close proximity to federal building entrances and in convenient locations throughout federal campuses, such as in parking facilities and at transit centers.
T.B.5	Find opportunities to allow regional and neighborhood trail access across federal land, working with federal security staff to determine appropriate access points, pathways, and hours of operation.
T.B.8	Provide publicly accessible bicycle racks, bicycle sharing stations, and parking for vehicle-sharing services on federal land, where possible, or coordinate with local jurisdictions to provide them near federal facilities.
T.B.9	Support roadway improvements that prioritize carpooling and the use of low-emission vehicles, including the use of high-occupancy vehicle lanes that provide priority access for high-capacity transit providers.
T.B.14	Work with local jurisdictions to improve the accessibility between the regional transit system and federal properties for all users through accessible pathways, sidewalks, streets, and curb ramps.
T.B.18	Provide designated pickup/drop-off locations for ride-hailing services at or near federal destinations to reduce parking demand, improve traffic circulation, and minimize conflicts with other travel modes.
T.C.7	Ensure transportation improvements are compatible with the existing transportation network and available services in the surrounding area.
T.C.8	Provide access and connections through federal campuses/workplaces to the local and regional transportation system, as appropriate, and minimize disruptions that result from security measures.
T.C.10	Provide a system of dedicated, inter-connected trails, protected bike lanes, and sidewalks, for pedestrians and other micro-mobility options, among federal campus entrance points and on all on-site buildings.
T.C.16	Encourage that surface parking lots, when no longer needed, are removed, converted to open space, or used for proposed development

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
T.D.1	Prepare Transportation Management Plans for federal facilities that encourage a multimodal transportation system that meets the needs of workers, residents, and visitors, while improving regional mobility, transportation access, and environmental quality. TMPs should be used as ongoing guidance documents over the terms of the plan, particularly to help agencies meet NCPC parking ratio policies and reduce SOV travel.
T.D.2	Develop an integrated Transportation Demand Management program as part of Transportation Management Plans to reduce impacts on regional congestion, improve environmental quality, and minimize parking demand at federal destinations.
T.D.3	Continue to monitor existing transportation demand management programs and transportation metrics, including the commute mode split for the facility.
T.D.4	Meet the following zone-based parking space-to-employee ratios: Transit-Rich Corridors: In highly Metro-accessible portions of the Historic DC boundary, the parking ratio should not exceed one space for every four employees (1:4). [75 percent non-SOV mode share] [..] Suburban Areas Beyond Metrorail: For all other locations in the region, including areas served by high-occupancy toll/high-occupancy vehicle lanes or high-frequency commuter rail, the parking ratio should not exceed one space for every two employees (1:2). [50 percent non-SOV mode share]
T.D.5	Provide priority spaces in convenient locations for high-occupancy and energy-efficient vehicles to improve sustainability.
T.D.6	In accordance with federal law, locate dedicated parking spaces for employees with ability impairments in locations that connect to the shortest accessible route to building entrances.
T.D.7	Limit parking for temporary users conducting official business at a given federal workplace. These spaces shall be exempted from the installation's employee/parking ratio as specific in Policy T.D.4. Visitor destinations with more substantial parking needs should refer to Section D.3 for applicable parking policies.
T.D.8	Provide limited parking spaces for fleet or operational vehicles as needed to meet mission requirements. These spaces shall be exempted from the installation's employee/parking ratio as specified in Policy T.D.4.
T.D.13	Consider a range of transportation management techniques to enhance multimodal access to visitor destinations before expanding parking, particularly for destinations in more isolated areas of the region. Such strategies may include improved multiuse trail connections, bus facilities, and sidewalks, along with improved pedestrian wayfinding.

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
<i>Parks and Open Space Element</i>	
POS.A.5.	Protect and maintain cultural landscapes as important architectural and landscape legacies of national and regional significance.
POS.B.6	Preserve and maintain trees, vegetation, natural areas, and open space on federal campuses that support wildlife habitats, improve scenic quality, and enhance aesthetic character. Preservation of these spaces should be compatible with the campus mission and programmatic needs.
POS.D.7	Identify opportunities to develop trails or connect trail systems when planning and designing projects throughout the region. Ensure that new development does not preclude future improvements to trail connections.
<i>Federal Environment Element</i>	
FE.A.1	Implement sustainable building design and transportation strategies to address the challenges of climate change and advance projects that will minimize fossil fuel consumption and reduce greenhouse gas emissions.
FE.A.7	Increase renewable energy and renewable energy generation on federal agency properties. Institute aggressive development of energy districts in federal project construction involving multiple buildings and/or other physical assets.
FE.A.8	Address climate change impacts in long-range plans, site selection, and capital projects by considering, among others, the effects of: <ol style="list-style-type: none"> 1. Risks of flooding (sea level rise, annual rainfall, intensity of rainfall) 2. Pollutant levels in runoff 3. Soil erosion 4. Increased stormwater runoff 5. Temperature extremes 6. Increased number and severity of storms such as hurricanes 7. Impact to tree viability and vegetation 8. Critical services and infrastructure reliability
FE.A.9	Assist in the development of regional climate adaptation and resilience plans to enable the National Capital Region and individual localities and utilities to prepare vulnerability assessments, conduct adaptation planning, and facilitate regional emergency preparedness.

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
FE.A.11	<p>Develop federal plans and projects consistent with agency, local, and regional climate adaptation and mitigation plans by:</p> <ol style="list-style-type: none"> 1. Prioritizing capital investments that are climate resilient and will increase the region’s adaptive capacity. 2. Coordinating climate adaptation actions with other federal, regional, and local agencies within the same geographic area (such as a drainage basin, shoreline community or coastal region). 3. Ensuring that federal actions do not create greater climate change vulnerabilities in local communities or the region. 4. Considering the long-term vulnerability of a community’s critical infrastructure to climate change risks during the site-selection process.
FE.B.1	<p>Reduce mobile source air pollutants by:</p> <ol style="list-style-type: none"> 1. Encouraging federal, state, and local governments, as well as private employers, to support improvements to, and use of, public transportation systems and enhance bicycle and pedestrian mobility. 2. Decreasing federal employee use of single-occupant vehicles and reducing the number and length of trips through operational policies, such as reduced parking ratios using Transportation Demand Management techniques and the location and design of workplace facilities. Transportation Demand Management techniques are defined in the Transportation Element. 3. Encouraging use of alternative clean fuels (e.g., electric, fuel cell, compressed natural gas, and “clean” diesel fuels) and promoting or increasing use of Alternative Fuel Vehicles. 4. Establishing alternative fueling locations on federal property and assigning preferred parking spots for low emission vehicles. 6. Designing parking lots to support electric vehicle charging stations, where electricity sources are from renewable resources
FE.C.1	<p>Develop stormwater management plans that:</p> <ol style="list-style-type: none"> 1. Encourage federal agencies and local jurisdictions to work together to develop stormwater management plans. 2. Encourage stormwater management at a campus or district-level.
FE.C.2	<p>Strengthen stormwater management practices for federal facilities and federal land to meet federal and regional requirements, specifically to restore clean water, recover habitat, sustain fish and wildlife, and increase public access.</p>
FE.C.5	<p>Use pervious surfaces and bio-retention facilities, if appropriate to the site, to reduce stormwater runoff and impacts on off-site water quality.</p>
FE.C.6	<p>Encourage the use of innovative and environmentally-friendly “Best Management Practices” in site and building design and construction practice, such as green roofs, bio-retention ponds, vegetated filtration strips, rain gardens, and permeable surface walkways, to reduce erosion and clean and capture stormwater on-site.</p>
FE.C.8	<p>Ensure that stormwater runoff does not impact neighboring properties.</p>
FE.D.1	<p>Collaborate with federal and regional agencies on flood management plans and flood protection projects.</p>

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
FE.D.2	Prohibit hazardous activities and critical actions in floodplain areas.
FE.D.3	Encourage modification of existing developments to remove or mitigate flood hazards, restore floodplain values, and improve water management. If the necessary modifications cannot be accomplished, the buildings should be removed when feasible to allow restoration of the floodplain and to correct flood hazards and restore floodplain values.
FE.D.4	Discourage investment in floodplain areas unless related to correcting flood hazards, restoring floodplain values, or supporting conservation, passive recreation, or memorial uses.
FE.D.5	<p>If construction in a floodplain is necessary:</p> <ol style="list-style-type: none"> 1. Preserve natural drainage where possible. 2. Elevate structures above base flood level. 3. Use best available flood proofing and protection measures. 4. Return the site as closely as possible to its natural contours. 5. Consider the cumulative impacts to the floodplain. 6. Consider long-term operational and capital costs associated with preparing and recovering from potential floods
FE.D.6	<p>Consider relocating outside of the floodplain when planning substantial improvements or repairs to an existing facility in a floodplain. If locating in a floodplain is necessary:</p> <ol style="list-style-type: none"> 1. Elevate all equipment and assets from the ground level floor, where flooding might be expected. 2. Apply flood proofing and protection measures to existing infrastructure to ensure that critical operations will not be disrupted during flood events.
FE.E.1	<p>Protect the physical and ecological functions of wetlands and riparian areas with priority in the following order:</p> <ol style="list-style-type: none"> 1. Avoid development of areas that contain wetlands, including isolated wetlands, or on sites that will impact the quality and health of nearby wetlands. 2. Minimize the impacts to wetlands by reducing the area of disturbances. If construction in a wetland is necessary, utilize the highest standard in project development requirements to minimize adverse impacts. 3. Replace wetlands that are lost or degraded as a result of site development.
FE.E.2	Avoid any intensive land uses with high amounts of impervious surface or significant pollution discharges within or adjacent to wetlands and riparian areas.
FE.E.3	Create vegetative and open space buffers around wetlands, waterways, or riparian areas when constructing near wetlands.
FE.E.4	Coordinate wetland activities with federal, state, and local government programs and regulations, including the Chesapeake Bay Program. Support local and regional watershed implementation plans and regulations.

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
FE.E.5	Design vegetated buffer strips around wetlands and waterbodies to capture and clean stormwater runoff. Encourage restoration of streams and stream banks that have been negatively impacted by runoff.
FE.E.6	Protect wetlands and waterbodies from indirect impacts such as significant adverse hydrological modifications, excessive sedimentation, deposition of toxic substances in toxic amounts, nutrient imbalances, and other adverse anthropogenic impacts.
FE.E.7	Promote improvement of degraded wetlands, especially during significant building or site improvements on federal property.
FE.E.8	Promote shoreline uses that create public access, improve riparian conditions, and enhance water quality.
FE.F.2	Employ best management practices to reduce the potential for soil erosion and the transportation of sediment, consistent with state and local requirements.
FE.F.6	Create and implement an erosion and sedimentation control plan during construction to prevent damage or loss of critical soils.
FE.F.7	Avoid soil compaction in design of landscape plans, during construction, and maintenance.
FE.F.8	Minimize tree cutting and other vegetation removal to support soil structure (slope geometry, location and geologic content), reduce soil disturbance, and limit erosion. When tree removal is necessary, replace trees, shrubs, and other vegetation to prevent a net vegetation loss.
FE.G.1	Preserve existing vegetation, especially large stands of trees
FE.G.2	<p>When tree removal is necessary, trees should be replaced to prevent a net tree loss to the project area, according to the following procedures:</p> <ol style="list-style-type: none"> 1. An evaluation of potential tree loss should be made prior to any removal. Trees shall be replaced according to the regulations of the local jurisdiction. 2. Trees of 10 inch diameter or less will be replaced at a minimum of a one-to-one basis. 3. Significant trees (diameter greater than 10 inch) will be replaced at a rate derived from a formula of the International Society of Arboriculture, or as established by the local jurisdiction's requirements for tree replacement. 4. The replacement of trees should be located on-site, on adjacent properties, or in areas within the site's jurisdiction.
FE.G.4	Incorporate new trees and vegetation into plans and projects to absorb carbon dioxide, moderate temperatures, minimize energy consumption, reduce pollution, and mitigate stormwater runoff. This includes the use of vegetation in the design and development of green roof projects where feasible and consistent with local regulations.
FE.G.6	Maintain and preserve woodlands adjacent to waterways, especially to aid in the control of erosion, sediment, and thermal pollution.
FE.G.7	Encourage the use of native plant species and remove invasive plants where appropriate.

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
FE.G.10	Use trees and other vegetation to offset emissions of greenhouse gases from operations. Plant and maintain trees and other vegetation to achieve long-term storage of carbon dioxide following accepted protocols that ensure offsets are permanent and verifiable.
FE.G.11	Support sustainable practices in federal landscape development to include, but not be limited to, the following: <ol style="list-style-type: none"> 1. Use of sustainable soil amendments. 2. Reduced irrigation runoff. 3. Reduced greenhouse gas emissions. 4. Use of Integrated Pest Management practices. 5. Reduced potable water consumption and recycling of all organic matter. 6. Introduction of plants that support pollinator species. 7. Selection of vegetation in the appropriate U.S. Department of Agriculture Plant Hardiness Zone, while accounting for regional changes in climate.
FE.I.5	Manage and dispose of hazardous wastes and toxic substances in a safe manner in accordance with national, state, and local regulations.
FE.I.6	Encourage federal facilities to develop and maintain an environmental management system to understand and manage the facility's environmental risks and hazards.
FE.J.1	Reduce levels of light pollution by: <ol style="list-style-type: none"> 1. Selecting the appropriate level of lighting to meet design needs, while minimizing excess light. 2. Designing light fixtures to eliminate upward and horizontal spillage. 3. Designing and providing appropriate controls to operate lighting only when needed, and at appropriate light levels. 4. Selecting lighting that minimizes maintenance, reduces energy use, and provides better visibility. 5. Selecting appropriate lighting technologies in a historic context.
FE.J.2	Evaluate exterior lights for their effectiveness, maintenance requirements, and energy use.
FE.J.3	Switch off all exterior lighting when not required
FE.K.2	Locate, design, and construct improvements to roads, driveways, loading docks, and parking lots for federal facilities in a manner that is sensitive to existing adjacent land uses

Policy Number	NCPC Comprehensive Plan for the National Capital: Federal Elements Policy
FE.K.3	Ensure that construction activities comply with local noise ordinances, and coordinate with local governments and adjacent communities to establish limits on the intensity and hours of noise generation
FE.K.4	Use low noise equipment, sound proofing technology, or install noise barriers to reduce the impact of noise from mechanical equipment or from everyday operations and activities.
FE.L.1	Improve environmental performance and reduce costs in existing federal buildings through targeted energy improvements, such as: 1. Optimizing the efficiency of heating, ventilation, and cooling systems with more efficient boilers, motors, and variable-speed drives. 2. Reducing energy and maintenance costs by installing centralized energy management systems.
FE.L.5	Pursue energy conservation strategies at a multi-building or district-level.
<i>Historic Preservation Element</i>	
HP.D.1	Ensure that new construction is compatible with the qualities and character of historic buildings and their settings, in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> and the <i>Guidelines for Rehabilitating Historic Buildings</i> .

**APPENDIX C
ENVIRONMENTAL JUSTICE SUPPORTING DATA**

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C.1 Introduction

The United States Department of Defense Washington Headquarters Services (WHS) has prepared a Final Environmental Assessment (EA) to evaluate the direct, indirect, and cumulative environmental impacts that would result from the implementation of the *2024 Pentagon Reservation Master Plan Update* (the Proposed Action). The purpose of the Proposed Action is to maintain the goals established in the 2016 Pentagon Reservation Master Plan Update, provide an update on current conditions, identify future projects, and analyze deficiencies in meeting new criteria established by Unified Facilities Criteria 2-100-01 (*Installation Master Planning*). WHS performed an environmental justice (EJ) analysis in support of the EA to consider the impacts of the *2024 Pentagon Reservation Master Plan Update* (Pentagon Master Plan).

This appendix describes the methods used to define the geographic scopes of analysis (i.e., a Pentagon Socio/EJ Study Area and a Mark Center Socio/EJ Study Area) and provides supplementary data to support the EJ affected environment analysis in Section 3.13 (Environmental Justice) of the Final EA. An in-depth analysis of the data in this appendix is provided in the Final EA, along with maps displaying the data. Additionally, refer to Section 4.13 (Environmental Justice) of the Final EA for an analysis of the Pentagon Master Plan's impacts to EJ communities in the defined study areas.

C.2 Methods and Data Sources

WHS used a refined buffer approach to define the geographic scopes of the EJ analysis for the Proposed Action to generate a Pentagon Socio/EJ Study Area and a Mark Center Socio/EJ Study Area. To determine the geographic scopes of analysis, WHS created a 0.5-mile buffer around the Pentagon site and Mark Center boundaries. WHS examined the U.S. Census block groups captured within this buffer and excluded block groups that have zero population within 0.5 miles of either site (e.g., the block group encompassing Ronald Reagan National Airport [DCA] [Block Group 510139802001] has zero residences within the buffer).

The resultant geographic scopes of analysis for purposes of the EJ analysis were defined as follows:

- Pentagon Socio/EJ Study Area: covers approximately 0.78 square miles, encompassing 4 block groups entirely and 8 block groups partially.
- Mark Center Socio/EJ Study Area: covers approximately 1.96 square miles, encompassing 5 block groups entirely and 13 block groups partially.

WHS used EPA's EJScreen 2.0¹ as the primary screening tool to assess social, economic, and environmental data for block groups in both the Pentagon and Mark Center Socio/EJ Study Areas. WHS downloaded EJScreen GIS data to facilitate the review in desktop ArcMap 10.8 (U.S. EPA, 2022a). WHS also used the "Add Shapefile" tool in EJScreen 2.0 to upload a shapefile of both the Pentagon and Mark Center Socio/EJ Study Areas and then used the "Generate Report" option to obtain indicator data specific to the whole of the geographic scopes of analysis (as reported by the EJScreen 2.0 algorithm) rather than just individual block group data from the GIS data download (U.S. EPA, 2022b; U.S. EPA, 2022c).

¹ See <https://ejscreen.epa.gov/mapper/>.

To supplement the analysis, WHS used the Council on Environmental Quality's (CEQ's) Climate and Economic Justice Screening Tool (CEJST) 1.0² to identify disadvantaged communities in the vicinity of the Pentagon site or Mark Center. CEJST 1.0 identifies communities as disadvantaged if they are in a census tract meeting the threshold for one or more of the following burdens:

- **Climate change:** Census tract is at or above the 65th percentile for low income *and* is at or above the 90th percentile for at least one of the following: expected agriculture loss rate, expected building loss rate, expected population loss rate, projected future flood risk, or projected future wildfire risk (CEQ, 2022).
- **Energy:** Census tract is at or above the 65th percentile for low income *and* is at or above the 90th percentile for at least one of the following: energy cost or particulate matter (PM) 2.5 in the air (CEQ, 2022).
- **Health:** Census tract is at or above the 65th percentile for low income *and* is at or above the 90th percentile for at least one of the following: asthma, diabetes, heart disease, or low life expectancy (CEQ, 2022).
- **Housing:** Census tract is at or above the 65th percentile for low income *and* experienced historic underinvestment or is at or above the 90th percentile for at least one of the following: housing cost, lack of green space, lack of indoor plumbing, or lead paint (CEQ, 2022).
- **Legacy pollution:** Census tract is at or above the 65th percentile for low income *and* has at least one abandoned mine land or Formerly Used Defense Site or is at or above the 90th percentile for at least one of the following: proximity to hazardous waste facilities, proximity to Superfund (National Priorities List) sites, or proximity to Risk Management Plan facilities (CEQ, 2022).
- **Transportation:** Census tract is at or above the 65th percentile for low income *and* is at or above the 90th percentile for at least one of the following: diesel PM exposure, transportation barriers, or traffic proximity and volume (CEQ, 2022).
- **Water and wastewater:** Census tract is at or above the 65th percentile for low income *and* is at or above the 90th percentile for at least one of the following: underground storage tanks and releases, or wastewater discharge (CEQ, 2022).
- **Workforce development:** Census tract has more than 10 percent of people ages 25 or older with a high school education *and* is at or above the 90th percentile for at least one of the following: linguistic isolation, low median income, poverty, or unemployment (CEQ, 2022).

C.3 Supporting Data

C.3.1 Pentagon Site Supporting Data

Minority and low-income population data derived from EJScreen 2.0 are provided in Table C-1 for block groups in the Pentagon Socio/EJ Study Area. Population statistics derived from EJScreen 2.0 for selected indicators of overburden are provided in Table C-2 for block groups in the Pentagon Socio/EJ Study Area. For figures and a narrative discussion related to these data, see Section 3.13 (Environmental Justice) of the Final EA for the Pentagon Master Plan. Results of the CEJST analysis for the Pentagon site are reported in Section 3.13 (Environmental Justice) of the Final EA.

² See <https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5>.

Table C-1. Minority and Low-Income Communities in the Vicinity of the Pentagon Site

Census Block Group Number	Minority		Low-Income	
	Percent of Population	State Percentile	Percent of Population	State Percentile
Pentagon Socio/EJ Study Area ^a	44%	62 nd	14%	35 th
<i>Block groups within or partially within the Pentagon Socio/EJ Study Area</i>				
510131025001 ^b	57%	76 th	6%	12 th
510131033001 ^b	69%	85 th	36%	75 th
510131034021 ^b	28%	41 st	2%	3 rd
510131034025 ^b	42%	59 th	13%	33 rd
510131035011	37%	53 rd	7%	15 th
510131035012	49%	67 th	0%	1 st
510131035013 ^b	35%	51 st	15%	38 th
510131035021	51%	70 th	14%	34 th
510131035022 ^b	42%	60 th	40%	79 th
510131035031	42%	59 th	8%	19 th
510131035032 ^b	51%	70 th	22%	52 nd
510131037001 ^b	24%	35 th	2%	3 rd

Sources: U.S. EPA, 2022a; U.S. EPA, 2022b.

a — The minority and low-income percentages and percentiles in this row were calculated by the EJScreen 2.0 mapper using the tool’s algorithm to obtain indicator values specific to the Pentagon Socio/EJ Study Area boundaries (U.S. EPA, 2022b).

b — The demographic indicator values for this block group represent the values for the entire block group; however, only a portion of this block group overlapped with the Pentagon Socio/EJ Study Area since the block group was bisected by the 0.5-mile buffer used to create the Pentagon Socio/EJ Study Area around the Pentagon boundaries.

Table C-2. Selected Indicators of Overburden for Communities in the Vicinity of the Pentagon Site

Census Block Group Number	State Percentiles for Selected Indicators							
	2017 Diesel PM	2017 Air Toxics Cancer Risk	2017 Air Toxics Respiratory Hazard Index	Traffic Proximity	Hazardous Waste Proximity	Wastewater Discharge	Particulate Matter 2.5	Linguistic Isolation
Pentagon Socio/EJ Study Area ^a	98 th	97 th	99 th	99 th	98 th	97 th	94 th	89 th
<i>Block groups within or partially within the Pentagon Socio/EJ Study Area</i>								
510131025001 ^b	98 th	97 th	99 th	98 th	97 th	96 th	95 th	53 rd
510131033001 ^b	98 th	97 th	99 th	99 th	96 th	91 st	94 th	71 st
510131034021 ^b	97 th	97 th	99 th	98 th	99 th	97 th	93 rd	84 th
510131034025 ^b	97 th	97 th	99 th	97 th	98 th	84 th	93 rd	53 rd
510131035011	98 th	97 th	99 th	99 th	98 th	97 th	94 th	53 rd
510131035012	98 th	97 th	99 th	99 th	99 th	97 th	94 th	96 th
510131035013 ^b	98 th	97 th	99 th	97 th	97 th	61 st	94 th	78 th
510131035021	98 th	97 th	99 th	98 th	99 th	97 th	94 th	90 th
510131035022 ^b	98 th	97 th	99 th	57 th	98 th	62 nd	94 th	98 th
510131035031	98 th	97 th	99 th	99 th	99 th	98 th	94 th	53 rd
510131035032 ^b	98 th	97 th	99 th	94 th	98 th	93 rd	94 th	95 th
510131037001 ^b	96 th	97 th	99 th	99 th	89 th	65 th	92 nd	53 rd

Sources: U.S. EPA, 2022a; U.S. EPA, 2022b.

a — The indicator percentiles in this row were calculated by the EJScreen 2.0 mapper using the tool’s algorithm to obtain indicator values specific to the Pentagon Socio/EJ Study Area boundaries (U.S. EPA, 2022).

b — The demographic indicator values for this block group represent the values for the entire block group; however, only a portion of this block group overlapped with the Pentagon Socio/EJ Study Area since the block group was bisected by the 0.5-mile buffer used to create the Pentagon Socio/EJ Study Area around the Pentagon boundaries.

C.3.2 Mark Center Supporting Data

Minority and low-income population data derived from EJScreen 2.0 are provided in Table C-3 for block groups in the Mark Center Socio/EJ Study Area. Population statistics derived from EJScreen 2.0 for selected indicators of overburden are provided in Table C-4 for block groups in the Mark Center Socio/EJ Study Area. For figures and a narrative discussion related to these data, see Section 3.13 (Environmental Justice) of the Final EA for the Pentagon Master Plan. Results of the CEJST analysis for the Mark Center are reported in Section 3.13 (Environmental Justice) of the Final EA.

Table C-3. Minority and Low-Income Communities in the Vicinity of the Mark Center

Census Block Group Number	Minority		Low-Income	
	Percent of Population	State Percentile	Percent of Population	State Percentile
Mark Center Socio/EJ Study Area ^a	67%	84 th	26%	59 th
<i>Block groups within or partially within the Mark Center Socio/EJ Study Area</i>				
515102001021 ^b	77%	90 th	58%	94 th
515102001022 ^b	74%	88 th	35%	73 rd
515102001023 ^b	43%	60 th	15%	36 th
515102001041 ^b	69%	85 th	36%	75 th
515102001042 ^b	77%	90 th	60%	95 th
515102001051	69%	85 th	21%	51 st
515102001052	85%	94 th	28%	62 nd
515102001061 ^b	61%	79 th	76%	98 th
515102001062 ^b	91%	97 th	39%	78 th
515102001063 ^b	55%	74 th	10%	25 th
515102001072 ^b	54%	73 rd	13%	32 nd
515102001073 ^b	54%	72 nd	19%	45 th
515102002011 ^b	41%	58 th	9%	20 th
515102002013 ^b	58%	76 th	9%	20 th
515102003011	52%	70 th	15%	36 th
515102003012	87%	95 th	30%	66 th
515102003021 ^b	22%	31 st	4%	7 th
515102003022 ^b	83%	93 rd	40%	79 th

Sources: U.S. EPA, 2022a; U.S. EPA, 2022c.

a — The minority and low-income percentages and percentiles in this row were calculated by the EJScreen 2.0 mapper using the tool’s algorithm to obtain indicator values specific to the Mark Center Socio/EJ Study Area boundaries (U.S. EPA, 2022c).

b — The demographic indicator values for this block group represent the values for the entire block group; however, only a portion of this block group overlapped with the Mark Center Socio/EJ Study Area since the block group was bisected by the 0.5-mile buffer used to create the Mark Center Socio/EJ Study Area around the Mark Center boundaries.

Table C-4. Selected Indicators of Overburden for Communities in the Vicinity of the Mark Center

Census Block Group Number	State Percentiles for Selected Indicators							
	2017 Diesel PM	2017 Air Toxics Cancer Risk	2017 Air Toxics Respiratory Hazard Index	Traffic Proximity	Hazardous Waste Proximity	Wastewater Discharge	Particulate Matter 2.5	Linguistic Isolation
Mark Center Socio/EJ Study Area^a	93 rd	97 th	96 th	97 th	77 th	51 st	90 th	91 st
<i>Block groups within or partially within the Pentagon EJ Study Area</i>								
515102001021 ^b	92 nd	97 th	95 th	31 st	63 rd	35 th	91 st	93 rd
515102001022 ^b	92 nd	97 th	95 th	21 st	62 nd	39 th	91 st	91 st
515102001023 ^b	92 nd	97 th	95 th	74 th	64 th	27 th	91 st	86 th
515102001041 ^b	92 nd	97 th	95 th	97 th	70 th	34 th	90 th	97 th
515102001042 ^b	92 nd	97 th	95 th	99 th	64 th	47 th	90 th	94 th
515102001051	91 st	97 th	95 th	92 nd	74 th	24 th	90 th	91 st
515102001052	91 st	97 th	95 th	99 th	78 th	62 nd	90 th	91 st
515102001061 ^b	93 rd	97 th	99 th	76 th	67 th	49 th	91 st	53 rd
515102001062 ^b	93 rd	97 th	99 th	92 nd	65 th	68 th	91 st	98 th
515102001063 ^b	93 rd	97 th	99 th	80 th	74 th	63 rd	91 st	86 th
515102001072 ^b	93 rd	97 th	99 th	92 nd	71 st	67 th	91 st	89 th
515102001073 ^b	93 rd	97 th	99 th	99 th	78 th	64 th	91 st	53 rd
515102002011 ^b	91 st	97 th	95 th	99 th	82 nd	65 th	89 th	53 rd
515102002013 ^b	91 st	97 th	95 th	98 th	94 th	46 th	89 th	85 th
515102003011	91 st	97 th	95 th	99 th	81 st	28 th	89 th	87 th
515102003012	91 st	97 th	95 th	99 th	84 th	25 th	89 th	81 st
515102003021 ^b	96 th	97 th	99 th	56 th	81 st	39 th	88 th	58 th
515102003022 ^b	96 th	97 th	99 th	99 th	71 st	37 th	88 th	95 th

Sources: U.S. EPA, 2022a; U.S. EPA, 2022c.

a — The indicator percentiles in this row were calculated by the EJScreen 2.0 mapper using their algorithm to obtain indicator values specific to the Mark Center Socio/EJ Study Area boundaries (U.S. EPA, 2022c).

b — The demographic indicator values for this block group represent the values for the entire block group; however, only a portion of this block group overlapped with the Mark Center Socio/EJ Study Area since the block group was bisected by the 0.5-mile buffer used to create the Mark Center Socio/EJ Study Area around the Mark Center boundaries.

C.4 References

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**APPENDIX D
COASTAL CONSISTENCY DETERMINATION**

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Coastal Zone Management Act (CZMA) Consistency Determination

This document provides the Commonwealth of Virginia with the Department of Defense (DoD) Washington Headquarters Services' (WHS) Consistency Determination under CZMA section 307(c)(1) and 15 Code of Federal Regulations (CFR) Part 930, subpart C, for the *Pentagon Reservation Master Plan Revision of the 2015 Update As Amended* (Pentagon Master Plan). The information in this Consistency Determination is provided pursuant to 15 CFR §930.39. This activity includes:

The Pentagon Master Plan includes 53 projects that would be implemented at the Pentagon Site or the Mark Center and that would address issues relating to security, new facility/land use, circulation, environment and sustainability, and energy at the Pentagon Site and Mark Center. Refer to Section 2 (Description of the Proposed Action and Alternative) of the *Draft Environmental Assessment for the Pentagon Master Plan* (Draft EA) for a list and brief description of all projects part of the Pentagon Master Plan. The goals of the Pentagon Master Plan are to maintain, enhance, and optimize the DoD Headquarters/Pentagon operations by: improving DoD Headquarters/Pentagon security; enhancing the safety and quality of life of employees and visitors; enhancing environmental sustainability on the reservation; and balancing the various planning factors/development pressures on the Reservation, including funding, security, safety, public access, historic preservation, being a good neighbor, and sustainability.

WHS has determined that the Pentagon Master Plan affects the land or water uses or natural resources of Virginia in the following manner:

Construction activities of the projects would disturb soils and would create temporary opportunities for erosion and sediment transport to surface waters, including in Resource Management Areas (RMAs) and near a Resource Protection Area (RPA). Both the Pentagon Site and Mark Center are located in Volatile Organic Compound (VOC) Emissions Control Areas, and construction activities, which include asphalt operations, would result in temporary increases of air pollutants, such as fugitive dust emissions.

Implementation of the Pentagon Master Plan would result in a net increase in green space at the Pentagon Site, thus increasing the square footage of permeable surface areas. Additionally, several projects would permanently modify stormwater management systems at the Pentagon Site, potentially changing stormwater runoff quality and quantity. These modifications would be expected to improve stormwater runoff quality.

Please refer to Section 4 (Environmental Consequences) of the Draft EA for more on the Pentagon Master Plan's potential impacts and benefits to land and water.

The Virginia Coastal Zone Management Program contains the following applicable enforceable policies:

I. Tidal and Non-Tidal Wetlands

Non-Tidal Surface Waters, Including Wetlands: It is the Commonwealth's policy that non-tidal surface waters, including wetlands and streams, shall be protected. Development shall only be permitted in a manner consistent with the protection of wetland acreage and function and stream function. Impacts to wetlands and streams shall be avoided or

minimized to the maximum extent practicable in order to achieve no net loss in non-tidal wetland acreage and function and to achieve no net loss in stream function.

Va. Code Ann. §§ 62.1-44.15:20 and -44.15:21; and 9 Va. Admin. Code §§ 25-210-10, -210-45, 210-80, 260-10, -380, -390

IV. Chesapeake Bay Preservation Areas

It is the policy of the Commonwealth to protect and improve the water quality of the Chesapeake Bay, its tributaries, and other state waters by minimizing the effect of human activity upon these waters. To that end, the Commonwealth will ensure that land use and development performance criteria and standards are implemented in Chesapeake Bay Preservation Areas, which if improperly used or developed may result in substantial damage to the water quality of the Chesapeake Bay and its tributaries.

Va. Code Ann. §§ 28.2-104.1, 62.1-44.15:24, -44.15:51, -44.15:67, -44.15:68, -44.15:69, -44.15:73, -44.15:74, and -44.15:78; 9 Va. Admin. Code §§ 25-830-30, -40, -80, -90, -100, -120, -130, -140, and -150

VI. Wildlife and Inland Fisheries (Wildlife & Fish)

Wildlife & Fish: No person shall import, export, take, pursue, kill or possess in the Commonwealth any fish or wildlife, or stock any species of fish in inland waters, in a manner that negatively impacts the Commonwealth's efforts in conserving, protecting, replenishing, propagating and increasing of the supply of game birds, game animals, fish and other wildlife of the Commonwealth.

Va. Code Ann. §§ 29.1-501, -512, -521, -530.2, -531, -533, -542, -543.1, -545, -548, -549, -550, -552, -554, -556, -569, and -574; 4 Va. Admin. Code §§ 15-30-10, -20, -50, and 15-290-60

Threatened and Endangered Species: No person shall harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, possess, collect, transport, sell or offer to sell, or attempt to do so, any species of fish or wildlife listed as threatened or endangered by the Board of Game and Inland Fisheries.

Va. Code Ann. §§ 29.1-501, -564, -566, -567, and -568; 4 Va. Admin. Code §§ 15-20-130 and -140

IX. Point Source Air Pollution

It is the policy of the Commonwealth, after observing the effects of air pollution, to abate, control, and prohibit air pollution throughout the Commonwealth.

Va. Code Ann. § 10.1-1308

Asphalt paving operations: It is the policy of the Commonwealth to limit volatile organic compound emissions in areas designated in VOC emissions control areas to protect air quality.

Va. Code Ann. §§ 10.1-1308 and -1322; 9 Va. Admin. Code §§ 5-20-206 and -45-780

Fugitive Dust Emissions: It is the policy of the Commonwealth that, during the construction or operation of any structure or facility, reasonable precautions will be taken to prevent particulate matter from becoming airborne.

Va. Code Ann. §§ 10.1-1308 and -1322; 9 Va. Admin. Code §§ 5-50-90 and -40-90

State Operating Permits (SOP): It is the policy of the Commonwealth to use the SOP to limit the emissions of a stationary source or emissions unit contributing to a violation of any air quality standard; or to establish a source-specific emission standard or other requirements, including, but not limited to, reasonably available control technology (RACT) or best available retrofit technology (BART) necessary to protect air quality within the Commonwealth.

Va. Code Ann. §§ 10.1-1308 and -1322; 9 Va. Admin. Code § 5-80-800

New Source Review: It is the policy of the Commonwealth to require the construction, reconstruction, relocation, or modification of regulated stationary sources to meet emission limits and operating requirements, based on the type of source, size of source, pollutant emission rates, pollutant categories, and location of source.

Va. Code Ann. §§ 10.1-1308 and -1322; 9 Va. Admin. Code §§ 5-80-1100, -1400, -1605, and -2000

XI. Nonpoint Source Water Pollution (DEQ):

It is the policy of the Commonwealth to control stormwater runoff to protect the quality and quantity of state waters from the potential harm of unmanaged stormwater; to control soil erosion and sediment deposition in order to prevent unreasonable degradation of properties, stream channels, state waters, and other natural resources; and to otherwise act to control nonpoint source water pollution to ensure the general health, safety, and welfare of the citizens of the Commonwealth.

Va. Code Ann. §§ 62.1-44.15:25, 62.1-44.15:52; 9 Va. Admin. Code §§ 25-840-30, 25-870-20

Based upon the following information, data, and analyses, WHS finds that the Pentagon Master Plan is consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Zone Management Program.

I. Tidal and Non-Tidal Wetlands:

Non-Tidal Surface Waters, Including Wetlands: No temporary construction activities or permanent development would occur in surface water bodies or wetlands and, therefore, would have no direct impact to these features. WHS would implement Best Management Practices (BMPs) during construction to reduce erosion, and indirect effects to nearby stream and wetland water quality would be negligible. BMPs would potentially include silt fencing, storm drain inlet protection, dust control, stormwater conveyance protection, perimeter controls, and temporary and permanent soil stabilization.

IV. Chesapeake Bay Preservation Areas:

An RPA designated by the Chesapeake Bay Preservation Ordinance is located along the eastern edge of the Pentagon Site. WHS maintains an installed riparian buffer within the RPA (Arlington County Code Chapter 61). The remaining areas of the Pentagon Site (Arlington County Code Chapter 61) and the whole of the Mark Center are part of lands designated as RMAs. No projects would be located within the Pentagon Site RPA. Some projects would be located in close proximity to the Pentagon Site RPA and would have greater likelihood to indirectly disturb wildlife through typical construction activities (e.g., noise from heavy construction vehicles, use of temporary lighting for worker safety). However, potential disturbances and habitat degradation would be temporary and minor, and wildlife would likely return and resume use of habitats after construction. Construction activities would maintain a 100-foot RPA buffer along the Boundary Channel and Pentagon Lagoon as prescribed by the Chesapeake Bay Preservation Ordinance of Arlington County (Arlington County Code Chapter 61). When applicable, the following strategies would be implemented in accordance with DoDI 4715.03 (*Natural Resources Conservation Program*)³: restore native vegetation and remove non-native and invasive vegetation; stabilize the bank; maintain integrity of the RPA vegetation; gather scientific data on species populations and habitat health; enhance natural scenery to support tenant and military fitness, well-being, and recreation; and increase public awareness on ways to help conserve and manage natural resources.

To minimize impacts to the habitat in the RPA and RMAs, the use of pesticides and herbicides would be discouraged to the maximum extent practicable. If other integrated pest management techniques have been considered and pesticides or herbicides are required, the chemicals proposed for use would be approved by WHS's Environmental, Sustainability, and Energy Branch and only applied per the product label, in proper weather conditions, by a certified pesticide applicator, and in accordance with all applicable laws and regulations.

Several of the projects in the Pentagon Master Plan would result in land disturbance exceeding 2,500 square feet and would thus require a Land Disturbing Activity permit. These projects are the South Secure Parking Project, Tree Box Filters Project, Old East Loading Dock Project, and Pentagon COR8 Pedestrian ACP Project. The land disturbance under all of these projects would occur outside of the Pentagon Site RPA. Overall reductions in impervious surfaces would also reduce stormwater runoff quantity and pollutant loadings, thus potentially improving the habitat quality of the Pentagon Site RPA.

VI. Wildlife and Inland fisheries:

Wildlife & Fish: Construction of the projects would potentially result in indirect disturbances to wildlife, such as migratory birds residing in the Pentagon Site's riparian area, due to increases in lighting, noise, and vibration from equipment during construction activities. However, potential disturbances and habitat degradation would be temporary and minor, and wildlife would likely return and resume habitats after construction. Overall increases in green spaces and reductions in impervious surfaces would improve potential habitat quality at the Pentagon Site. Construction and project operations would have no impacts on fish.

³ <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/471503p.pdf?ver=2017-10-05-073238-040>

Threatened and Endangered Species: Construction and operation of the projects would have no impact on federally or state listed species due to inadequate or unavailable habitat on the Pentagon Site. No critical habitat exists at the Pentagon site, and no work would be located in the riparian habitat, which is the only area of habitat value on the Pentagon Site.

IX. Point source air pollution:

Asphalt paving operations: Both Arlington County and Alexandria City are within VOC Emissions control areas. The Pentagon Master Plan includes several projects that would involve asphalt paving operations. WHS would follow the asphalt requirements outlined in Virginia's Enforceable Policies, including the Standards for Visible Emissions, Standard for Fugitive Dust/Emissions, and Standard for Odor standards listed in the Enforceable Policies.

Fugitive dust emissions: Reasonable measures would be taken to prevent particulate matter from becoming airborne. A Construction Air Quality Management Plan would be prepared and followed when required, and a Dust Mitigation Plan would be prepared and followed for all projects when needed. Dust control would be provided in accordance with UFC 3-260-17 *Dust Control for Roads, Airfields And Adjacent Areas* to the extent practicable. Spilled or tracked dirt or other materials would be promptly removed from paved streets. All construction vehicles leaving the site would be cleaned of loose dirt. For indoor projects, installation and use of hoods, fans, and fabric filters would be used to enclose and vent the handling of dusty materials. For some projects, water may be used to control dust during demolition, construction operations, the grading or roads, and/or the clearing of land.

State Operating Permits (SOP) and New Source Review: Permitted stationary sources at the Pentagon Site and at the Mark Center would continue to operate within the limits outlined in their SOPs. When applicable, WHS would use RACT or BART. Under Implementation of the Pentagon Master Plan, the Pentagon Site's and Mark Center's emissions would continue to be well below the permitted limits.

XI. Nonpoint source water pollution:

Although construction activities for some projects would potentially increase stormwater pollutants, BMPs and erosion and sediment control measures would be implemented to reduce erosion. To minimize erosion and sediment discharge into nearby water bodies, construction activities would follow General VPDES MS4 Permit requirements, and construction stormwater controls would be approved by a VESCP authority and installed during construction activities. These controls would include the similar controls as those listed under the *I. Tidal and Non-Tidal Waters* analysis above such as silt fencing, storm drain inlet protection, dust control, stormwater conveyance protection, perimeter controls, and temporary and permanent soil stabilization. When appropriate, a Construction General Permit from VA DEQ or a Land Disturbing Activity Permit would be obtained for applicable projects. See analysis for *IV. Chesapeake Bay Preservation* for more on the Land Disturbing Activity Permits and for more information on impact-reducing strategies.

Several projects within the Pentagon Master Plan would incorporate permeable surfaces and permanent stormwater BMPs—such as bioretention areas, native landscaping, vegetated swales, stormwater plants, and tree box filters—to reduce pollutant loadings to nearby river bodies (i.e., Pentagon Lagoon, Boundary Channel, Potomac River) resulting from stormwater

runoff. Overall incorporation of permeable surfaces and stormwater BMPs would increase the amount of stormwater infiltrating through soils and would help WHS meet the WHS Chesapeake Bay Total Maximum Daily Load Action Plan targets as required by the General VPDES MS4 Permit. These measures would be expected to result in long-term improvements to the water quality of these river bodies.

Pursuant to 15 CFR Section 930.41, the Virginia Coastal Zone Management Program has 60 days from the receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR section 930.41(b). Virginia's concurrence will be presumed if its response is not received by WHS on the 60th day from receipt of this determination. The State's response should be sent to:

Joe Eichenlaub
Environmental Branch Manager
Department of Defense
Washington Headquarters Services/Facilities Services Directorate
Environmental and Sustainability Branch
(703) 614-9583
joseph.d.eichenlaub.civ@mail.mil

**APPENDIX E
GENERAL CONFORMITY RULE RECORD OF NON-APPLICABILITY**

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FACILITIES SERVICES
DIRECTORATE

RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT GENERAL CONFORMITY RULE



1. PROJECT INFORMATION

PROJECT NAME	PENTAGON MASTER PLAN: REVISION OF THE 2016 UPDATE AS AMENDED (PENTAGON MASTER PLAN)
Tracking number	22-107
Points of contact	Brian King, brian.r.king.civ@mail.mil
Action proponent organization	WHS
Project location	Outdoors & Indoors; Pentagon Site, Arlington, VA; Mark Center, Alexandria, VA
Project description	
<p>The Pentagon Master Plan includes 53 projects that would be implemented at the Pentagon site or the Mark Center and that would address issues relating to security, new facility/land use, circulation, environment and sustainability, and energy at the Pentagon Site and Mark Center. Refer to Section 2 (Description of the Proposed Action and Alternative) of the Draft Environmental Assessment for the Pentagon Master Plan (Draft EA) for a list and brief description of all projects in the Pentagon Master Plan. The goals of the Pentagon Master Plan are to maintain, enhance, and optimize the DoD Headquarters/Pentagon operations by improving DoD Headquarters/Pentagon security; enhancing the safety and quality of life of employees and visitors; enhancing environmental sustainability on the reservation; and balancing the various planning factors and development pressures on the site.</p> <p>Construction activities would vary for each project. However, all short-term projects that involve construction activities would result in minor, temporary direct emissions from sources and activities such as on-road and nonroad construction vehicles, compressors, generators, earth disturbance, and asphalt paving and resurfacing. These emissions would occur intermittently over the course of the next five years as individual short-term projects are implemented and would cease upon the completion of construction activities for each project. Implementation of short-term energy projects would reduce electrical use and total energy consumption. Several short-term projects would potentially lead to a minor reduction in fossil fuel combustion emissions at the Pentagon site by improving traffic flow, facilitating ridesharing, and promoting electrical vehicle use. Several short-term projects, including but not limited to the CVIF Project and other security and safety projects, could require the installation of new diesel emergency generators. Use of these generators during routine testing and infrequent grid outages and emergencies would result in minor, temporary direct emissions (diesel combustion). Otherwise, the short-term projects would not require the installation or modification of permitted stationary sources and would not affect the State Operating Permit.</p>	



FACILITIES SERVICES
DIRECTORATE

RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT GENERAL CONFORMITY RULE



2. GENERAL CONFORMITY RULE OVERVIEW

Under the Clean Air Act Section 176(c), as implemented by the General Conformity Rule (GCR) (40 CFR Part 93, Subpart B), federal agencies must ensure that federal activities conform to an approved state or federal implementation plan and do not cause or contribute to new violations of National Ambient Air Quality Standards (NAAQS). This Record of Non-Applicability documents that the requirements of the GCR do not apply to the evaluated project because it is an exempt action and/or will have total direct and indirect emissions that do not exceed the *de minimis* thresholds defined at 40 CFR 93.153(b).

The Pentagon is located in Arlington County, Virginia, which is designated as a moderate nonattainment area for the 8-Hour Ozone (2015) NAAQS and a maintenance area for carbon monoxide (CO). The precursor pollutants that contribute to the formation of ozone include nitrogen oxides (NOx) and volatile organic compounds (VOCs). The *de minimis* thresholds for this nonattainment area are **50 tons per year (tpy) VOC, 100 tpy NOx, and 100 tpy CO**. The Mark Center is located in Alexandria City, Virginia, which has the same nonattainment status and applicable *de minimis* thresholds as Arlington County.

3. GCR APPLICABILITY ANALYSIS

The following analysis has been conducted for the project described in Section 1 above.

ANALYSIS	COMMENTS
1. The GCR does not apply, based on the categories listed under 40 CFR 93.153(c)(2), (c)(3), (c)(4), or (d): <input type="checkbox"/> True. <i>[Specify appropriate non-applicability category and regulatory citation.]</i> <input checked="" type="checkbox"/> False. Proceed to Step 2.	
2. The GCR does not apply because total direct and indirect emissions will be below the <i>de minimis</i> levels (40 CFR 93.153(c)(1)). <i>[Specify annual emission rate for each nonattainment pollutant and precursor. Attach supporting data and calculation sheets as appropriate.]</i> <input checked="" type="checkbox"/> True. A Conformity Determination is not required. <input type="checkbox"/> False. A Conformity Determination may be required. <i>[Do not finish this form. Contact the ESEB Program Manager for further instructions.]</i>	The <i>de minimis</i> thresholds for this area are 50 tpy VOC, 100 tpy NOx, and 100 tpy CO. Emissions from each short-term Master Plan project would be below <i>de minimis</i> thresholds. See Attachment A for supporting calculations and discussion.

4. APPROVAL

As documented in Section 3, this project has been reviewed for General Conformity under 40 CFR Part 93, Subpart B and the requirements of the GCR do not apply.

TITLE	NAME	SIGNATURE	DATE
Branch Manager: Environmental and Sustainability Branch	Joseph Eichenlaub	EICHENLAUB.JOS EPH.D.1228982233 <small>Digitally signed by EICHENLAUB,JOSEPH.D.1228982233 Date: 2023.04.25 10:54:11 -04'00'</small>	04/25/2023

ATTACHMENT A

To demonstrate that the increase in criteria pollutant emissions for each Master Plan project would be below the applicable General Conformity Rule (GCR) *de minimis* levels—and to do so without the unnecessary effort of performing emissions calculations for each project—WHS compared the scopes of the two largest short-term projects of the Master Plan against three DoD “reference” projects for which modeled or calculated emissions estimates are available. These reference projects are all of similar or greater scope than the Master Plan projects but have emissions well below *de minimis* levels.

For this comparison, WHS selected the two short-term Master Plan projects that would be expected to result in the greatest annual increase in criteria pollutant emissions, based on their building and/or pavement construction scopes: the Metro Entrance Pedestrian Access Control Point (ACP) Project and the South East Parking Project.

Metro Entrance Pedestrian ACP Project: This project would redevelop the employee screening facility and ACP at the Pentagon entrance adjacent to the Pentagon Metro station. The project would provide approximately 15,800 gross square feet (SF) of new construction, including a new visitor’s center. Annual operational emissions, including indirect emissions from electrical use and steam heating and potential direct emissions from emergency generator use, are expected to be minor compared to the temporary construction-related emissions.

The South East Parking Project: This project is the largest paving project in the Master Plan. This project would realign the Connector Road, North Rotary Road, and Eads Street intersection; convert Fern Street from a one-way to two-way road; and upgrade sidewalks in the South Parking lot. The construction area for this project would be approximately 477,000 SF. A majority of this Project’s emissions would derive from paving and asphalt activities.

Because no Master Plan project would involve installation of significant emissions units, direct operational emissions for all Master Plan projects would be expected to be well below *de minimis* levels. While several short-term projects could require the installation of new diesel emergency generators, use of these generators would be limited to routine testing and infrequent grid outages and emergencies.

WHS selected the following three recent DoD “reference” projects: Fort Belvoir North Area Project (FBNA Project), Aerospace Data Facility Implementation of the Electrical Infrastructure Master Plan Project (Aerospace Project), and TrueNorth Commons Enhanced Use Lease Area (TrueNorth Project). WHS selected these projects because they had scopes similar to or larger than the Metro Entrance Pedestrian ACP Project and the South East Parking Project, were DoD projects, and underwent calculations to determine project-specific criteria pollutant emissions during construction. Additionally, the TrueNorth Project is a particularly helpful comparison for the South East Parking Project, as both projects have similar areas of asphalt and paving work. Emissions estimates for two of the reference projects also account for operational emissions (e.g., heating buildings and operating emergency generators), which provides an appropriate comparison for Master Plan projects with similar types of operational emissions.

Table 1 provides the estimated emissions for each reference project under a “worst-case scenario” year and describes the scope of construction and operations reflected in the emissions estimates. For each reference project, the worst-case scenario represents the annual emissions increase that would occur if

all construction activities were compressed into one calendar year, rather than taking place over three-to-eight years. Additionally, for two of these projects, these estimates also assume that operational emissions would take place concurrently with construction emissions. These estimates therefore should substantially overestimate the potential annual emissions from these projects, providing for an environmentally protective analysis. As shown in Table 1, criteria pollutant emissions for all three reference projects would be well below *de minimis* levels for Arlington County, Virginia, despite these “worst-case” assumptions.

Because the scope of the Metro Entrance Pedestrian ACP Project (approx. 15,800 SF construction, minimal operational emissions) is substantially smaller than that of all three reference projects, WHS concludes that emissions from this project would be well below *de minimis* levels. Similarly, because the scope of the South East Parking Project (approx. 477,000 SF paving, no operational emissions) is substantially smaller than that of the TrueNorth project, WHS concludes that emissions from this project would be well below *de minimis* levels.

Overall, WHS concludes that construction and operational emissions for all short-term Master Plan projects would be well below *de minimis* levels. Therefore, a Conformity Determination under the GCR is not required for any short-term project.

Table 1. Worst-Case Annual Emissions from Reference Projects

Reference Project/Document	Worst-Case Annual Emissions Increase (tpy)			Notes
	NOx	VOC	CO	
Fort Belvoir North Area (FBNA) Distribution Center, Environmental Assessment, 2022 ^a	12.2	8.2	10.7	<ul style="list-style-type: none"> – Scope of construction includes construction of 5 buildings and associated parking features. The project would have a 525,000 SF building footprint. – “Worst-case” annual emissions represent the combined emissions from 3 years of construction and 1 year of operational emissions (i.e., heating buildings and operating emergency generators) as if all activities occurred in 1 year.
Aerospace Data Facility Colorado Implementation of the Electrical Infrastructure Master Plan, Buckley Air Force Base, Colorado, Environmental Assessment, 2020 ^b	6.4	1.8	7.9	<ul style="list-style-type: none"> – Scope of construction includes construction of a 13.2-kilovolt Central Power Plant and demolition of the existing Central Power Plant. The project would have a 50,000 SF building footprint. – “Worst-case” annual emissions represent the combined emissions from 8 years of construction as if all activities occurred in 1 year. Does not include operational emissions.
TrueNorth Commons Enhanced Use Lease Area, Draft Final Environmental Assessment, 2019 ^c	47.9	13.2	76.5	<ul style="list-style-type: none"> – Scope of construction includes development of a multi-building Commercial Development Area. The project would have a 690,000 SF building footprint as well as 770,000 SF of paved areas. – “Worst-case” annual emissions represent the combined emissions from 6 years of construction and approximately 9 months of operational emissions (e.g., heating and cooling buildings, backup generators) as if all activities occurred in one year.
De Minimis levels for Arlington County, VA (tpy)	100	50	100	

a — Source: U.S. Army Corps of Engineers. 2022. Fort Belvoir North Area (FBNA) Distribution Center Environmental Assessment. September 20 22.

b — Source: U.S. Air Force. 2020. Draft Environmental Assessment for Aerospace Data Facility Colorado Implementation of the Electrical Infrastructure Master Plan, Buckley Air Force Base, Colorado. June 2020.

c — Source: U.S. Air Force. 2019. Draft Final Environmental Assessment: TrueNorth Commons Enhanced Use Lease Area. United States Air Force Academy, El Paso County, Colorado Springs, Colorado. May 2019. Prepared by Matrix Environmental Services, LLC.

**APPENDIX F
EXTERNAL CORRESPONDENCE**

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Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

P.O. Box 1105, Richmond, Virginia 23218

(800) 592-5482

www.deq.virginia.gov

Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

October 26, 2023

Ms. Blake Fox
Department of Defense
Sent via email: blake.a.fox4.ctr@mail.mil

Mr. Joe Eichenlaub
Department of Defense
Sent via email: joseph.d.eichenlaub.civ@mail.mil

RE: Department of Defense Draft Environmental Assessment and Federal
Consistency Determination: 203 Pentagon Reservation Master Plan Update
(DEQ 23-132F)

Dear Ms. Fox and Mr. Eichenlaub:

The Commonwealth of Virginia has completed its review of the draft Environmental Assessment (EA), which includes a federal consistency determination (FCD), for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating state reviews of FCDs submitted under the Coastal Zone Management Act. This letter is in response to the above-referenced EA and FCD. The review period started on September 5, 2023, when sufficient information was received to start the review federal consistency review. The following agencies and locality participated in this review:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Health
Department of Historic Resources

Marine Resources Commission
Arlington County

The Department of Wildlife Resources, Northern Virginia Regional Commission and the City of Alexandria also were invited to comment.

PROJECT DESCRIPTION

The Department of Defense submitted an EA and FCD for the implementation of projects identified as short-term in the Pentagon Master Plan. The master plan includes 53 projects that would be implemented at the Pentagon Site in Arlington County or the Mark Center in the City of Alexandria that would address issues relating to security, new facility or land use, circulation, environment and sustainability, and energy. While land disturbance would occur, the FCD states that implementation of the projects would result in an increase in green space and improved stormwater management at the Pentagon. There are 15 short-term projects that are identified as security and safety projects at the Pentagon Site. The EA and FCD do not identify the locations of these infrastructure improvements because they are considered Controlled Unclassified Information. These projects include construction of a commercial vehicle inspection facility, parking lot improvements, upgrading windows and doors, and installing a fence. There are two short-term projects that are considered new facility and land use change projects. These include replacing or constructing a center courtyard stage and stairs and a control tower and fire day station. There are 10 short-term projects, which include parking improvements and pedestrian safety projects, that will improvement circulation. Five short-term projects, including stormwater management improvements, are considered environment and sustainability projects. Finally, there are 15 short-term energy projects that include plant upgrades, electric vehicle charge stations, and solar installations. The master plan identified four long-term projects that are proposed to be implemented over the next 6 to 20 years, and these projects will require additional NEPA analysis. The EA evaluates the proposed action and no-action alternative.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

This FCD is submitted pursuant to the federal consistency regulation 15 Code of Federal Regulations Part 930 Subpart C Section 930.31. Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities located inside or outside of Virginia's designated coastal management area that can have reasonably foreseeable effects on coastal resources or coastal uses must, to the maximum extent practicable, be implemented in a manner consistent with the Virginia Coastal Zone Management (CZM) Program. The Virginia CZM Program consists of a network of programs administered by several agencies. In order to be consistent with the Virginia CZM

Program, the project activities must be consistent with the enforceable policies of the Virginia CZM Program and all the applicable permits and approvals listed under the enforceable policies of the Virginia CZM Program must be obtained prior to commencing the project. DEQ coordinates the review of FCDs with agencies administering the enforceable and advisory policies of the Virginia CZM Program.

PUBLIC PARTICIPATION

In accordance with 15 CFR §930.2, a public notice of this proposed action was published in the DEQ Office of Environmental Impact Review Program Newsletter and on the DEQ website from September 11, 2023 to October 5, 2023. No public comments were received in response to the notice.

FEDERAL CONSISTENCY CONCURRENCE

The FCD states that the project is consistent to the maximum extent practicable with the enforceable policies of the Virginia CZM Program. The reviewing agencies that are responsible for the administration of the enforceable policies generally agree with the FCD. Based on the review of the FCD and the comments submitted by agencies administering the enforceable policies of the Virginia CZM Program, DEQ concurs that the proposed project is consistent to the maximum extent practicable with the Virginia CZM Program, provided all applicable permits and approvals are obtained as described below. However, other state approvals which may apply to this project are not included in this FCD. Therefore, the federal agency must also ensure that this project is constructed and operated in accordance with all applicable federal, state and local laws and regulations. In addition, in accordance with 15 CFR Part 930, subpart C, § 930.39(c), we recommend that the responsible party consider the Advisory Policies of the Virginia CZM Program (<https://www.deq.virginia.gov/our-programs/environmental-impact-review/federal-consistency>).

If, prior to construction, the project should change significantly and any of the enforceable policies of the Virginia CZM Program would be affected, pursuant to 15 CFR 930.46, the federal agency must submit supplemental information to DEQ for review and approval.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Point Source Air Pollution. The EA (Volume 2, FCD PDF page 214) states that the Master Plan includes several projects that would involve asphalt paving operations, and asphalt requirements in the enforceable policies would be followed. Reasonable measures would be taken to prevent particulate matter from becoming airborne.

Permitted stationary sources would continue to operate within the limits of their State Operating Permits.

1(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that implement Virginia's Air Pollution Control Law (Virginia Code §10.1-1300 *et seq.*). DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate DEQ regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. As a part of this mandate, environmental impact reviews (EIRs) of projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

The Air Division regulates emissions of air pollutants from industries and facilities and implements programs designed to ensure that Virginia meets national air quality standards. The most common regulations associated with projects are:

- Open burning: 9VAC5-130 *et seq.*
- Fugitive dust control: 9VAC5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9VAC5-80-1100 *et seq.*

1(b) Requirements. The following requirements may be applicable to the proposed project.

1(b)(i) Fugitive Dust. During land-disturbing activities, fugitive dust must be kept to a minimum by using control methods outlined in 9VAC5-50-60 *et seq.* of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or suitable chemicals for dust control during the proposed demolition and construction operations and from material stockpiles;
- Installation and use of hoods, fans and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and

- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

1(b)(ii) Open Burning. Should any open burning or use of special incineration devices be employed in the disposal of land clearing debris during demolition and construction, the operation would be subject to the Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100. The regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. Contact officials with the locality to determine what local requirements, if any, exist.

1(b)(iii) Fuel-Burning Equipment. Fuel-burning equipment (generators, compressors, etc.) or any other air-pollution-emitting equipment may be subject to registration or permitting requirements.

1(b)(iv) Stationary Source. Stationary air emissions sources constructed at this location may be subject to 9 VAC 5-80-1120. The regulation requires obtaining an air permit before starting actual construction of, or operation of any new stationary source. Any changes that affect the impact of the facilities on air quality may require an air permit.

1(c) Agency Finding. The DEQ Northern Virginia Regional Office (NRO) states that the Pentagon holds air registration number 70030, which is a synthetic minor permit. The Mark Center holds air registration number 73748, which is also a synthetic minor permit.

1(d) Conclusion. Provided the project complies with applicable requirements or any permit modifications, including adherence to any permitting requirements, it would be consistent to the maximum extent practicable with the point source air pollution enforceable policy of the Virginia CZM Program.

2. Tidal and Non-Tidal Wetlands. The EA (Volume 2, FCD PDF page 212) states that no development activities will occur in wetland areas and best management practices would be implemented during construction to reduce erosion.

2(a) Agency Jurisdiction. The State Water Control Board promulgates Virginia's water regulations covering a variety of permits to include the Virginia Pollutant Discharge Elimination System Permit regulating point source discharges to surface waters, Virginia Pollution Abatement Permit regulating sewage sludge, storage and land application of biosolids, industrial wastes (sludge and wastewater), municipal wastewater, and animal wastes, the Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection (VWP) Permit regulating impacts to streams, wetlands,

and other surface waters. The VWP Permit is a state permit which governs wetlands, surface water, and surface water withdrawals and impoundments. It also serves as §401 certification of the federal Clean Water Act and §404 permits for dredge and fill activities in waters of the U.S. The VWP Permit Program is under the Office of Wetlands and Stream Protection within the DEQ Division of Water Permitting. In addition to central office staff who review and issue VWP permits for transportation and water withdrawal projects, the six DEQ regional offices perform permit application reviews and issue permits for the covered activities:

- Clean Water Act, §401;
- Section 404(b)(i) Guidelines Mitigation Memorandum of Agreement (2/90);
- State Water Control Law, Virginia Code section 62.1-44.15:20 *et seq.*; and
- State Water Control Regulations, 9VAC25-210-10.

Tidal wetlands are regulated by the Virginia Marine Resources Commission (VMRC) under the authority of Virginia Code §28.2-1301 through §28.2-1320.

2(b) Agency Findings. DEQ NRO states that measures should be taken to avoid and minimize impacts to surface waters and wetlands during construction activities. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs).

2(c) Requirements. If construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the federal agency should contact DEQ NRO VWPP staff to determine the need for any permits prior to commencing work that could impact surface waters or wetlands. A VWP permit from DEQ may be required should impacts to surface waters be necessary. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Army Corps of Engineers (Corps). The Corps is the authority for an official confirmation of whether there are federal jurisdictional waters, including wetlands, which may be impacted by the proposed project. DEQ may confirm additional waters as jurisdictional beyond those under federal authority. Review of National Wetland Inventory maps or topographic maps for locating wetlands or streams may not be sufficient; there may need to be a site-specific review of the site by a qualified professional.

2(d) Conclusion. Provided adherence any applicable requirements, the project would be consistent to the maximum extent practicable with the tidal and non-tidal wetlands enforceable policy of the Virginia CZM Program.

3. Chesapeake Bay Preservation Areas. The EA (Volume 2, FCD PDF page 213) states that land analogous to Resource Protection Area (RPA) is located along the eastern edge of the Pentagon Site. DOD maintains an installed riparian buffer within the land analogous to RPA. The remaining areas of the Pentagon Site and the whole of the Mark Center are part of lands that are analogous to RMAs. No projects would be located within the Pentagon Site RPA. Some projects would be located in close proximity to the Pentagon Site RPA. Construction activities would maintain a 100-foot RPA buffer along the Boundary Channel and Pentagon Lagoon

3(a) Agency Jurisdiction. The DEQ Office of Watershed and Local Government Assistance Programs administers the Chesapeake Bay Preservation Act (Virginia Code §62.1-44.15:67 *et seq.*) and Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830-10 *et seq.*). Each Tidewater locality must adopt a program based on the Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management Regulations. The Act and regulations recognize local government responsibility for land use decisions and are designed to establish a framework for compliance without dictating precisely what local programs must look like. Local governments have flexibility to develop water quality preservation programs that reflect unique local characteristics and embody other community goals. Such flexibility also facilitates innovative and creative approaches in achieving program objectives. The regulations address nonpoint source pollution by identifying and protecting certain lands called Chesapeake Bay Preservation Areas. The regulations use a resource-based approach that recognizes differences between various land forms and treats them differently.

3(b) Chesapeake Bay Preservation Area. In the City of Alexandria and in Arlington County, the areas protected by the Chesapeake Bay Preservation Act, as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by each of the local governments. RPAs include tidal wetlands, certain non-tidal wetlands, tidal shores, and a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. All lands within the City of Alexandria and Arlington County not located within the RPA are designated as RMA. Resource Management Areas require less stringent performance criteria than RPAs.

3(c) Agency Findings. The DEQ Office of Watershed and Local Government Assistance Programs (OWLGAP) states that while national security protocols limit the amount of specific information provided relative to the proposed land development activities, master plan goals for the Pentagon identify projects that would occur on land analogous to locally designated RMA. There are no plans for land development or land-

disturbing activities on land analogous to RPA associated with Boundary Channel or the Pentagon Lagoon. There are only two exterior projects proposed for the Mark Center, both of which are classified as unspecified energy projects and both proposed for the North Parking Garage. Both project areas are located on land analogous to locally designated RMA and there are no anticipated impacts to lands analogous to locally designated RPA lands.

3(d) Requirements. Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in §9VAC25-830-130 and 140 of the Regulations, including the requirement to minimize land disturbance (including access and staging areas), retain existing vegetation and minimize impervious cover as well as including compliance with the requirements of the *Virginia Erosion and Sediment Control Handbook*, and stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations.*” For land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook*.

3(e) Previous Construction. DEQ (OWLGAP) states that it should be noted that a portion of the southern half of the West Tower and the majority of the South Parking Lot garage are currently located in the RPA buffer associated with an unnamed creek that runs parallel to and between the Mark Center campus and I-395. This construction would not have been possible without a significant and inappropriate encroachment into the RPA. It is not known when, and by what regulatory standards, approval for land development with such an extensive encroachment was granted by the City of Alexandria. It is not known if a site-specific RPA determination was ever carried in the area in question. It is also not known if a plan for vegetative mitigation to offset the RPA encroachment was required of the DOD as a condition for development. There is no record of DEQ staff, either the Office of Environmental Review or the Office of Watersheds and Local Government Assistance Programs, ever receiving or reviewing the Mark Center project that led to the construction of the above-referenced buildings within the RPA buffer. It is important to note that, while the above RPA encroachment has no bearing on the current and proposed Mark Center project, an encroachment into the RPA of such magnitude, and as a result of major land development, would not have been considered at the time of review to be consistent with the Act and the Regulations.

3(f) Conclusion. Provided the DOD adheres to the above-referenced requirements, the project would be consistent to the maximum extent practicable with the Chesapeake Bay Preservation Areas enforceable policy of the Virginia CZM Program.

4. Erosion and Sediment Control and Stormwater Management. The EA (Volume 2, FCD, PDF page 214) indicates that the project would adhere to applicable erosion and sediment controls and stormwater management requirements. Although construction activities for some projects would potentially increase stormwater pollutants, best management practices and erosion and sediment control measures would be implemented to reduce erosion. In addition, the EA (Volume 1, page 3-12) states that the Pentagon's General VPDES MS4 Permit requires a portion of total nitrogen, total phosphorus, and TSS load reductions by June 30, 2023, and full reductions by June 30, 2028, to meet Chesapeake Bay total maximum daily load (TMDL) requirements.

4(a) Agency Jurisdiction. The DEQ Office of Stormwater Management (OSM) administers the following laws and regulations governing construction activities:

- Virginia Erosion and Sediment Control Law (VESCL) (§ 62.1-44.15:51 *et seq.*) and Regulations (VESCL&R) (9VAC25-840);
- Virginia Stormwater Management Act (VSMA) (§ 62.1-44.15 *et seq.*);
- Virginia Stormwater Management Program (VSMP) regulation (9VAC25-870); and
- 2014 General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities (9VAC25-880).

In addition, DEQ is responsible for the VSMP General Permit for Stormwater Discharges from Construction Activities related to Municipal Separate Storm Sewer Systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program (9VAC25-890-40).

4(b) Requirements.

4(b)(i) Erosion and Sediment Control and Stormwater Management Plans. The applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with VESCL&R and Virginia Stormwater Management Law and Regulations (VSWML&R), including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 2,500 square feet on lands analogous to a Chesapeake Bay Preservation Area would be regulated by VESCL&R. Accordingly, the applicant must prepare and implement an erosion and sediment control (ESC) plan to

ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 2,500 square feet on lands analogous to a Chesapeake Bay Preservation Area would be regulated by the VSWML&R. Accordingly, the applicant must prepare and implement a stormwater management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan should be submitted to the DEQ regional office that serves the area where the project is located for review and compliance. The applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy (Reference: VESCL 62.1-44.15 *et seq.*).

4(b)(ii) General Permit for Stormwater Discharges from Construction Activities (VAR10). DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The owner or operator of projects involving land-disturbing activities of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific Stormwater Pollution Prevention Plan. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations (Reference: Virginia Stormwater Management Act 62.1-44.15 *et seq.*; VSMP Permit Regulations 9VAC25-880 *et seq.*).

4(c) Agency Findings. DEQ NRO states that numerous stormwater management permits are active for both sites. At the Pentagon, the following permit numbers are active: VAR10M727, VAR10N527, VAR10N917, VAR10O735, VAR10O989, and VAR10I822. At the Mark Center, the following permit numbers are active: VAR10E005 and VAR10R720. In addition, DEQ NRO states that the Pentagon has a MS4 general permit (VAR040103).

4(d) Conclusion. Assuming adherence to the above-reference requirements as well as any necessary permit modifications, if necessary, the project would be consistent to the

maximum extent practicable with the nonpoint source pollution control management enforceable policy of the Virginia CZM Program.

5. Historic Structures and Architectural Resources. The EA (Volume 1, pages 4-12 to 4-13) states that short-term projects would be located throughout the Pentagon site, both adjacent to and within the Pentagon Historic District boundary. Other short-term projects would be in the viewshed of the historic district. All other short-term projects are expected to have minimal or no potential for adverse effects on historic properties.

5(a) Agency Jurisdiction. The Virginia Department of Historic Resources (DHR) conducts reviews of both federal and state projects to determine their effect on historic properties. Under the federal process, DHR is the State Historic Preservation Office, and ensures that federal undertakings – including licenses, permits, or funding – comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation at 36 CFR Part 800. Section 106 requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places.

5(b) Agency Findings. DHR has been in direct consultation with DOD and its agents/contractors regarding this project and reached consensus that 2023 Pentagon Reservation Master Plan Update will result in no adverse effects to historic properties. Per Section 106 of the National Historic Preservation Act, the DOD will continue consult with DHR on individual projects that are discussed in the Master Plan updates.

6. Public Drinking Water. The EA (page 3-42 and 3-44) states that both the Pentagon and the Mark Center are served by potable water.

6(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water (ODW) reviews projects for the potential to impact public drinking water sources (groundwater wells, springs and surface water intakes). VDH administers both federal and state laws governing waterworks operation.

6(b) Agency Findings. The VDH ODW states that there are no apparent impacts to public drinking water sources due to this project.

7. Pesticides and Herbicides. In general, when pesticides or herbicides must be used, their use should be strictly in accordance with manufacturers' recommendations. In addition, DEQ recommends that the responsible agent use the least toxic pesticides or herbicides effective in controlling the target species. For more information on pesticide or herbicide use, please contact the Virginia Department of Agriculture and Consumer Services (804- 371-6560).

8. Natural Heritage Resources. The EA (page 3-15) states that because most of the Pentagon site is covered by impervious surfaces, vegetation and tree cover within the Pentagon site are minimal except along Boundary Channel Drive and the Pentagon Lagoon. The Pentagon site has approximately 79 acres of green space or open space, but these areas typically lack sufficient vegetation and/or sustainable plants. The Mark Center consists mostly of buildings and paved impervious surfaces with limited ornamental vegetation. However, the Winkler Botanical Preserve is located directly adjacent to the western boundary of the Mark Center.

8(a) Agency Jurisdiction.

8(a)(i) The Virginia Department of Conservation and Recreation’s (DCR) Division of Natural Heritage (DNH): DNH’s mission is conserving Virginia’s biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act (Virginia Code §10.1-209 through 217), authorized DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and to protect and ecologically manage the natural heritage resources of Virginia (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features).

8(a)(ii) The Virginia Department of Agriculture and Consumer Services (VDACS): The Endangered Plant and Insect Species Act of 1979 (Virginia Code Chapter 39 §3.1-1020 through 1030) authorizes VDACS to conserve, protect and manage endangered and threatened species of plants and insects. Under a Memorandum of Agreement established between VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

8(b) Agency Findings – Natural Heritage.

Pentagon Site, Mark Center Site

According to the information currently in the Biotics Data System, natural heritage resources have not been documented within the submitted project boundary, including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

8(c) Agency Findings – Threatened and Endangered Plant and Insect Species.

The current activity will not affect any documented state-listed plants or insects.

8(d) Agency Findings – State Natural Area Preserves. There are no State Natural Area Preserves under DCR’s jurisdiction in the project vicinity.

8(e) Agency Recommendations. Contact the DCR DNH and resubmit project information and a map if the scope of the project changes and/or six months has passed before it is utilized.

9. Solid and Hazardous Waste Management. The EA (page 4-32) states that all short-term projects are expected to produce some solid waste from construction and operation, as well as negligible amounts of hazardous waste. DOD has a construction specification with a target of diverting a minimum of 60 percent of construction waste from landfills; that target would be applied to the projects in the proposed action.

9(a) Agency Jurisdiction. On behalf of the Virginia Waste Management Board, the DEQ Division of Land Protection and Revitalization is responsible for carrying out the mandates of the Virginia Waste Management Act (Virginia Code §10.1-1400 *et seq.*), as well as meeting Virginia's federal obligations under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation Liability Act (CERCLA), commonly known as Superfund. The DEQ Division of Land Protection and Revitalization also administers those laws and regulations on behalf of the State Water Control Board that govern Petroleum Storage Tanks (Virginia Code §62.1-44.34:8 *et seq.*), including Aboveground Storage Tanks (9VAC25-91 *et seq.*) and Underground Storage Tanks (9VAC25-580 *et seq.* and 9VAC25-580-370 *et seq.*), also known as Virginia Tank Regulations, and § 62.1-44.34:14 *et seq.* which covers oil spills. Virginia:

- Virginia Waste Management Act, Virginia Code § 10.1-1400 *et seq.*
- Virginia Solid Waste Management Regulations, 9VAC20-81
 - (9VAC20-81-620 applies to asbestos-containing materials)
- Virginia Hazardous Waste Management Regulations, 9VAC20-60
 - (9VAC20-60-261 applies to lead-based paints)
- Virginia Regulations for the Transportation of Hazardous Materials, 9VAC20-110.

Federal:

- Resource Conservation and Recovery Act (RCRA), 42 U.S. Code sections 6901 *et seq.*

- U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107
- Applicable rules contained in Title 40, Code of Federal Regulations.

9(b) Database Search. The DEQ Division of Land Protection and Revitalization (DLPR) conducted a search (200-foot radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area. DLPR identified three (3) RCRA small quantity generators, one (1) solid waste permitted facility, two (2) VRP sites, and fourteen (14) petroleum release sites within the project area which might impact the project.

DLPR staff has reviewed the submittal and offers the following comments:

Hazardous Waste/RCRA Facilities – Three (3) found in close proximity to the project area.

1. Registry ID 110071228883, Target Store T3430, 900 ARMY NAVY DR, STE A2, Arlington, VA 22202, Small Quantity Generator, Active Status: Y
2. Registry ID 110063002236, PENTAGON RESERVATION, 1 NOTARY RD, Arlington, VA 22211, Small Quantity Generator, Active Status: Y
3. Registry ID 110005255213, DOUBLETREE HOTEL, 300 ARMY NAVY DR, Arlington, VA 22202, Small Quantity Generator, Active Status: Y

CERCLA Sites – none in close proximity to the project area.

Formerly Used Defense Sites (FUDS) – none in close proximity to the project area.

Solid Waste – One (1) found in close proximity to the project area.

1. Solid Waste Permit (Daily): PMT ID: 900000002569, US Dept. of Defense – Pentagon SW Incinerator, 425 Old Jefferson Davis Hwy, Arlington, VA 22202, Permit Operating Status: Active

Virginia Remediation Program (VRP) – Two (2) found in close proximity to the project area.

1. VRP01046, Pen Place, 550 Army Navy Dr, Arlington, VA 22202, Primary Status: Enrolled in Program
2. VRP00036, Pentagon Heating and Cooling, Arlington, VA 22211, Primary Status: Pre-VRP

Petroleum Releases – Fourteen (14) found in close proximity to the project area.

1. PC Number 19983629, Radisson Hotel, 5000 Seminary Rd, Alexandria, Virginia, Release Date: 12/15/1997, Status: Closed.
2. PC Number 20063081, Hilton Alexandria Mark Center, 5000 Seminary Rd, Alexandria, Virginia, Release Date: 10/10/2005, Status: Closed.
3. PC Number 19973031, 400 Army Navy Drive Site, 400 Army Navy Dr, Arlington, Virginia, Release Date: 09/05/1996, Status: Closed
4. PC Number 20223030, Pen Place, 12th & South Eads Street, Arlington, Virginia, Release Date: 09/09/2021, Status: Closed
5. PC Number 19921701, Pentagon Heating and Refrigeration Plant, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 02/24/1992, Status: Closed
6. PC Number 20223069, Heating and Refrigeration Plant – Pentagon, 1155 Defense Pentagon Rm MF737, Washington DC, District of Columbia, Release Date: 11/17/2021, Status: Closed
7. PC Number 19954089, Pentagon Building, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 10/16/1994, Status: Closed
8. PC Number 19920521, Pentagon – Motor Pool Gas Station, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 09/16/1991, Status: Closed
9. PC Number 19940808, Pentagon River Entrance, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 11/08/1993, Status: Closed
10. PC Number 19944296, Pentagon Courtyard, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 06/13/1994, Status: Closed
11. PC Number 19973203, Pentagon Bell Atlantic, Pentagon, Arlington, Virginia, Release Date: 06/05/1997, Status: Closed
12. PC Number 19910522, Bell Atlantic – Pentagon, Pentagon, Arlington, Virginia, Release Date: 10/08/1990, Status: Closed
13. PC Number 19901475, Pentagon Sewage Pump Station, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 04/29/1990, Status: Closed
14. PC Number 20073077, Arlington National Cemetery Pump House, Boundary Channel Dr, Arlington, Virginia, Release Date: 08/23/2006, Status: Closed

9(c) Agency Findings. DEQ NRO states that the Pentagon holds RCRA ID VA2210090021. The Pentagon property also has numerous closed Pollution Control Remediation sites. Additionally, the Pentagon holds a permit by rule for an onsite waste incinerator, PBR-197.

9(d) Agency Recommendations. Evaluate the identified waste sites to determine their ability to affect the project site if not already conducted. DEQ encourages all projects to implement pollution prevention principles, including:

- the reduction, reuse and recycling of all solid wastes generated; and
- the minimization and proper handling of generated hazardous wastes.

9(e) Requirements.

- The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction, the project manager would follow applicable federal, state, and local regulations for their disposal.
- The removal, relocation or closure or installation/operation of any regulated petroleum storage tanks, aboveground storage tank (AST) or underground storage tank (UST), must be conducted in accordance with the requirements of the Virginia Tank Regulations 9 VAC 25-91-10 *et seq.* (AST) and / or 9 VAC 25-580-10 *et seq.* (UST). Submit appropriate documentation to DEQ.
- Test and dispose of any soil/sediment that is suspected of contamination or wastes that are generated during construction-related activities in accordance with applicable federal, state, and local laws and regulations.
- Any future site activities involving excavation or disturbance of formerly petroleum contaminated soils and or groundwater must be reported to DEQ, as authorized by Virginia Code § 62.1-44.34.8 through 9 and 9 VAC 25-580-10 *et seq.*
- Petroleum-contaminated soils and ground water generated during implementation of this project must be properly characterized and disposed of properly.
- All construction and demolition waste, including any excess soil, must be characterized in accordance with the Virginia Hazardous Waste Management Regulations and disposed of at an appropriate facility as applicable.
- If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by Code of Virginia 62.1-44.34.8 through 19 and 9VAC 25-580-10 *et seq.*
- All structures being demolished or removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM and LBP are found, in addition to the federal waste-related regulations mentioned above, state regulations 9VAC20-81-640 for ACM and 9VAC20-60-261 for LBP must be followed.

10. Floodplain Management. The EA (page 4-3) states that road projects may impact the 100-year floodplain. Some short-term projects would construct permanent infrastructure in the 500-year floodplain.

10(a) Agency Jurisdiction. DCR is the lead coordinating agency for the Commonwealth's floodplain management program and the National Flood Insurance Program (Code of Virginia § 10.1-602).

10(b) Agency Findings. The National Flood Insurance Program (NFIP) is administered by Federal Emergency Management Agency (FEMA) and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

The DCR Floodplain Management Program does not have regulatory authority for projects in the Special Flood Hazard Area (SFHA). The applicant/developer must contact the local floodplain administrator for an official floodplain determination and comply with the community's local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality. For federal projects, the applicant/developer is encouraged to contact the local floodplain administrator and comply with the community's local floodplain ordinance.

10(c) Requirements.

- All development within a SFHA, as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.
- Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

11. Point Source Water Pollution. The EA and FCD do not address point source water pollution. The EA (Volume 2, FCD PDF page 3-43) states that the Pentagon wastewater treatment plant was decommissioned and demolished in 2022.

11(a) Agency Jurisdiction. The policy is administered by DEQ to protect existing high quality state waters and restore all other state waters to permit all reasonable public uses and support the propagation and growth of all aquatic life. Legal authority is granted by the

National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to Section 402 of the federal Clean Water Act and administered by DEQ as the Virginia Pollutant Discharge Elimination System (VPDES) permit program (*Virginia Code* § 62.1-44.2; 9 VAC § 25-31-20).

11(b) Agency Findings. DEQ NRO states that the Pentagon holds VPDES Permit No. VA0032000, an Industrial Minor Discharge Permit, as well as VAR040103, a MS4 general permit.

11(c) Requirements. DEQ NRO states that a construction project may require coverage under the VAG83 permit for discharges from petroleum contaminated sites, groundwater remediation, and hydrostatic tests for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered.

11(d) Conclusion. Provided the project adheres to any requirements, it would be consistent to the maximum extent practicable with the point source water pollution enforceable policy of the Virginia CZM Program.

12. Subaqueous Lands. The EA does not specifically address subaqueous lands but states that no construction activities would occur in surface water bodies (FCD Volume 2, PDF page 212).

12(a) Subaqueous Lands. All decisions affecting subaqueous lands shall be guided by the Commonwealth's General Policy to conserve, develop, and utilize its natural resources, its public lands, and its historical sites and buildings and to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth. The General Assembly has authorized the Virginia Marine Resources Commission (VMRC) to grant or deny any use of state-owned bottomlands, including dredging, aquaculture, the taking and use of material from the bottomland, and the placement of wharves, bulkheads, and fill. (*Virginia Code* §§ 28.2-1200, -1203, -1204 and -1205).

12(b) Agency Findings. VMRC states that the proposed action does not impact resources within the jurisdiction of the Virginia Marine Resources Commission (VMRC) and will not require a permit.

12(c) Requirements. Should the proposed project change, contact VMRC as a new review may be required relative to its jurisdictional areas.

12(d) Conclusion. As proposed, the project is consistent to the maximum extent practicable with the subaqueous lands enforceable policy of the Virginia CZM Program.

13. Local Coordination. As customary, DEQ invited the affected localities and planning district commission to comment.

13(a) Federal Consistency Local and Regional Jurisdiction. In accordance with CFR 930, Subpart A, § 930.6(b) of the Federal Consistency Regulations, DEQ, on behalf of the state, is responsible for securing necessary review and comment from other state agencies, the public, regional government agencies, and local government agencies, in determining the Commonwealth's concurrence or objection to a federal consistency certification.

13(b) Locality Comments. Arlington County does not have substantive comments. Consistent with past and present practice, Arlington County requests that DOD follow Arlington County's requirements for regulated land disturbing activities, including procedures for reviewing potential RPA impacts. Details can be found online at: [Land Disturbing Activity / Stormwater Permit Overview – Official Website of Arlington County Virginia Government \(arlingtonva.us\)](https://www.arlingtonva.us/land-disturbing-activity-stormwater-permit-overview)
[Resource Protection Area Requirements – Official Website of Arlington County Virginia Government \(arlingtonva.us\)](https://www.arlingtonva.us/resource-protection-area-requirements)

Arlington County's previously submitted comments on the EA are attached.

REGULATORY AND COORDINATION NEEDS

1. Air Quality Regulations. The following regulations may apply during construction or operation:

- fugitive dust and emissions control (9VAC5-50-60 *et seq.*)
- permits for fuel-burning equipment (9VAC5-80-110 *et seq.*)
- open burning restrictions (9VAC5-130 *et seq.*)
- stationary air emissions (9 VAC 5-80-1120)

Contact officials with the appropriate locality for information on any local requirements pertaining to open burning if necessary. Contact DEQ NRO (David Hartshorn at 571.408.1778 or r.david.hartshorn@deq.virginia.gov) for additional information on obtaining a permit as necessary.

2. Water Quality and Wetlands. If construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the applicant

should contact DEQ NRO VWPP staff (Natasha Nahas at natasha.nahas@deq.virginia.gov) to determine the need for any permits prior to commencing work that could impact surface waters or wetlands.

3. Chesapeake Bay Preservation Areas. Land disturbance and proposed development/redevelopment activities on lands analogous to RMA must be consistent with the general performance criteria provisions of 9VAC25-830-130 of the Regulations, which includes disturbing no more land than necessary to provide for the proposed use, minimizing impervious cover, and preserving indigenous vegetation to the maximum extent practicable consistent with the proposed use. All land disturbing activity exceeding 2,500 square feet must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook*, Third Edition, 1992. Finally, stormwater management criteria consistent with the water quality protection provisions of the *Virginia Stormwater Management Regulations*, 9VAC25-870-51 and 9 VAC25-870-103, shall be satisfied. For questions, contact the DEQ Office of Watersheds and Local Government Assistance Programs (Daniel Moore at Daniel.Moore@deq.virginia.gov).

4. Erosion and Sediment Control and Stormwater Management Plans. The applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with VESCL&R and VSWML&R, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Submit the ESC and SWM plans to DEQ NRO (Reference: VESCL 62.1-44.15 *et seq.*). Coordinate with DEQ NRO (Mark Remsberg at 703-583-3874 or mark.remmsberg@deq.virginia.gov).

5. General Permit for Stormwater Discharges from Construction Activities (VAR10). The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). Coordinate with DEQ NRO (Mark Remsberg at 703-583-3874 or mark.remmsberg@deq.virginia.gov) as necessary.

6. Historic Resources. Continue consult with DHR (Jenny Bellville-Marrion at Jennifer.Bellville-Marrion@dhr.virginia.gov) on individual projects that are discussed in the Master Plan updates.

7. Water Supply. Contact VDH (Arlene Warren at Arlene.Warren@vdh.virginia.gov) for additional information about its comments if necessary.

8. Natural Heritage Resources. Contact the DCR DNH (804-371-2708) about its recommendations and to re-submit project information and a map for an update on natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

9. Solid Waste and Hazardous Substances. All solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations. If free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ NRO (Jim Datko at 571-866-6446 or james.datko@deq.virginia.gov). Any future site activities involving excavation or disturbance of formerly petroleum contaminated soils and or groundwater must be reported to DEQ, as authorized by Code of Virginia 62.1-44.34.8 through 19 and 9VAC25-580-10 *et seq.*

9(a) Asbestos-Containing Material. It is the responsibility of the owner or operator of a renovation or demolition activity, prior to the commencement of the renovation or demolition, to thoroughly inspect the affected part of the facility where the operation will occur for the presence of asbestos, including Category I and Category II nonfriable asbestos-containing material (as applicable). Upon classification as friable or non-friable, all asbestos-containing material shall be disposed of in accordance with the Virginia Solid Waste Management Regulations (9VAC20-81-640) and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9VAC20-110-10 *et seq.*). Contact the DEQ Division of Land Protection and Revitalization (Nikolas Churchill at Nikolas.Churchill@deq.virginia.gov) and the Department of Labor and Industry (804-371- 2327) for additional information.

9(b) Lead-Based Paint. If applicable, this project must comply with the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) regulations and with the Virginia Lead-Based Paint Activities Rules and Regulations. For additional information regarding these requirements, contact the Department of Professional and Occupational Regulation (804-367-8500).

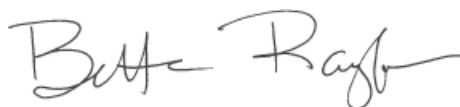
10. Floodplain. The federal agency should ensure compliance with applicable floodplain requirements. To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory.

11. Point Source Water Pollution. Coordinate with DEQ NRO (Rebecca Johnson at rebecca.johnson@deq.virginia.gov) for coverage under the VAG83 permit as necessary.

12. Subaqueous Lands. Should the proposed project change, contact VMRC (Mike Johnson at mike.johnson@mrc.virginia.gov) as a new review may be required relative to its jurisdictional areas.

Thank you for the opportunity to comment on this EA and FCD. The detailed comments of reviewers are attached. If you have questions, please do not hesitate to call me at 804-659-1915 or Julia Wellman at (804) 774-8237.

Sincerely,

A handwritten signature in black ink that reads "Bettina Rayfield". The signature is fluid and cursive, with the first name "Bettina" and last name "Rayfield" clearly distinguishable.

Bettina Rayfield, Manager
Environmental Impact Review and Long Range
Priorities Program

Enclosures

ec: Lee Brann, DWR
Allison Tillett, DCR
Arlene Warren, VDH
Roger Kirchen, DHR
Claire Gorman, VMRC
Roger Lazaro, Northern Virginia Regional Commission
Mark Schwartz, Arlington County
James Parajon, City of Alexandria

2023 Pentagon Reservation Master Plan Update, DEQ #23-132F

Mann, Katherine (DEQ) <Katherine.Mann@deq.virginia.gov>

Thu 9/14/2023 4:32 PM

To:Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

Cc:Miller, Mark (DEQ) <Mark.Miller@deq.virginia.gov>

Northern Regional Office comments regarding the environmental assessment request for 2023 Pentagon Reservation Master Plan Update, DEQ #23-132F, are as follows:

Land Protection Division – The Pentagon holds RCRA ID VA2210090021. The Pentagon property also has numerous closed Pollution Control Remediation sites. Additionally, the Pentagon holds a permit by rule for an onsite waste incinerator, PBR-197. The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction, the project manager would follow applicable federal, state, and local regulations for their disposal. For additional Land Protection/Waste questions, please contact the regional waste program manager Jim Datko at 571.866.6446 or james.datko@deq.virginia.gov.

Air Compliance/Permitting - The Pentagon holds air registration number 70030, which a synthetic minor permit. The Mark Center holds air registration number 73748, which is also a synthetic minor permit. The project manager is reminded that during the construction phases that occur with this project; the project is subject to the Fugitive Dust/Fugitive Emissions Rule 9 VAC 5-50-60 through 9 VAC 5-50-120. In addition, should any open burning or use of special incineration devices be employed in the disposal of land clearing debris during demolition and construction, the operation would be subject to the Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100. Additionally, the project manager is reminded, stationary air emissions sources constructed at this location may be subject to 9 VAC 5-80-1120. The regulation requires obtaining an air permit before starting actual construction of, or operation of any new stationary source. Any changes that affect the impact of the facilities on air quality may require an air permit. For additional air questions please contact the regional air compliance manager David Hartshorn at 571.408.1778 or r.david.hartshorn@deq.virginia.gov.

Virginia Water Protection Permit (VWPP) Program – The project manager is reminded that a VWP permit from DEQ may be required should impacts to surface waters be necessary. Measures should be taken to avoid and minimize impacts to surface waters and wetlands during construction activities. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Army Corps of Engineers. The Army Corps of Engineers is the authority for an official confirmation of whether there are federal jurisdictional waters, including wetlands, which may be impacted by the proposed project. DEQ may confirm additional waters as jurisdictional beyond those under federal authority. Review of National Wetland Inventory maps or topographic maps for locating wetlands or streams may not be sufficient; there may need to be a site-specific review of the site by a qualified professional. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs). If construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the applicant should contact DEQ-NRO VWPP staff to determine the need for any permits prior to commencing work that could impact surface waters or wetlands. Upon receipt of a Joint Permit Application for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance. VWPP staff reserve the right to provide comment upon receipt of a permit application requesting authorization to impact state surface waters, and at such time that

a wetland delineation has been conducted and associated jurisdiction determination made by the U.S. Army Corps of Engineers. For additional VWP questions, please contact the regional VWP compliance manager Natasha Nahas at 571.866.6496 or natasha.nahas@deq.virginia.gov.

Erosion and Sediment Control, Storm Water Management – DEQ has regulatory authority for the Virginia Pollutant Discharge Elimination System (VPDES) programs related to municipal separate storm sewer systems (MS4s) and construction activities. Erosion and sediment control measures are addressed in local ordinances and State regulations. Additional information is available at <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx>. Non-point source pollution resulting from this project should be minimized by using effective erosion and sediment control practices and structures. Consideration should also be given to using permeable paving for parking areas and walkways where appropriate, and denuded areas should be promptly revegetated following construction work. If the total land disturbance exceeds 10,000 square feet, an erosion and sediment control plan will be required. Some localities also require an E&S plan for disturbances less than 10,000 square feet. A stormwater management plan may also be required. For any land disturbing activities equal to one acre or more, you are required to apply for coverage under the VPDES General Permit for Discharges of Storm Water from Construction Activities. The Virginia Stormwater Management Permit Authority may be DEQ or the locality. Numerous stormwater management permits are active for both sites. At the Pentagon the following permit numbers are active: VAR10M727, VAR10N527, VAR10N917, VAR10O735, VAR10O989, and VAR10I822. At the Mark Center the following permit numbers are active: VAR10E005 and VAR10R720. For additional storm water construction questions please contact the regional storm water program manager Mark Remsberg at 703.583.3874 or mark.remsberg@deq.virginia.gov.

Other VPDES Permitting –The Pentagon holds VPDES Permit No. VA0032000, and Industrial Minor Discharge Permit, as well as VAR040103, a MS4 general permit. A construction project may require coverage under the VAG83 permit for discharges from petroleum contaminated sites, groundwater remediation, and hydrostatic tests for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered. For additional water permitting/compliance questions please contact the regional water compliance manager Rebecca Johnson at 571.866.6500 or rebecca.johnson@deq.virginia.gov.



Katherine Mann
Enforcement Specialist, Northern Regional Office
[Virginia Department of Environmental Quality](http://www.deq.virginia.gov)
13901 Crown Court
Woodbridge, VA 22193
(m) (571) 866-6095
(o) (703) 583-3800



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

P.O. Box 1105, Richmond, Virginia 23218

(800) 592-5482 FAX (804) 698-4178

www.deq.virginia.gov

Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

MEMORANDUM

TO: Julia Wellman, DEQ Office of Environmental Impact Review

FROM: Daniel Moore, DEQ Principal Environmental Planner

DATE: October 14, 2023

SUBJECT: DEQ #23-132F – US ACOE: 2023 Pentagon Reservation Master Plan, Arlington County and City of Alexandria

We have reviewed the Environmental Assessment and Federal Consistency Determination for the proposed master plan projects and offer the following comments regarding consistency with the provisions of the Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations):

In the City of Alexandria and in Arlington County, the areas protected by the *Chesapeake Bay Preservation Act* (CBPA), as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by each of the local governments. RPAs include tidal wetlands, certain non-tidal wetlands, tidal shores, and a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. All lands within the City of Alexandria and Arlington County not located within the RPA are designated as RMA. Resource Management Areas require less stringent performance criteria than RPAs.

The submitted Federal Consistency Determination and Environmental Assessment for the 2023 Pentagon Reservation Master proposes numerous site improvements at the Pentagon, headquarters for the U.S. Department of Defense, located on 245 acres of land in southeast Arlington County and at the DoD facilities located at the Mark Center campus, 16 acres of land at the intersection of I-395 and Seminary Road in the City of Alexandria.

While national security protocols limit the amount of specific information provided relative to the proposed land development activities, master plan goals for the Pentagon include the following:

- Land use changes and environment and sustainability-related changes to the South Parking Lot located between Army Navy Drive and Shirley Memorial Highway (I-395);
- Land use changes to the Pentagon Courtyard and the northwest corner of the Pentagon building;
- Vehicular, bicycle and pedestrian circulation changes throughout the Pentagon campus;
- An Areawide Resurfacing and Rehabilitation Project for roadways and parking lot pavements and an Areawide Sidewalk Improvements Project and;
- Environment and sustainability changes throughout the Pentagon campus, including the uses of BMPs for stormwater management practices.

The above-referenced changes are all proposed on land identified as RMA. As referenced in the submitted Draft Environmental Assessment (see p. 2-21), “The entire Pentagon campus is within a Resource Protection Area (RMA), and the 100-foot border along Boundary Channel and the Pentagon Lagoon is a Resource Protection Area (RPA) per the Virginia Chesapeake Bay Act and as designated by the Chesapeake Bay Act Ordinance of Arlington County...” There are no plans for land development or land-disturbing activities in the RPA associated with Boundary Channel or the Pentagon Lagoon.

There are only two exterior projects proposed for the Mark Center, both of which are classified as unspecified energy projects and both proposed for the North Parking Garage. Both project areas are located on locally-designated RMA lands and there are no impacts to RPA lands anticipated.

It should be noted that a portion of the southern half of the West Tower and the majority of the South Parking Lot garage are currently located in the RPA buffer associated with an unnamed creek that runs parallel to and between the Mark Center campus and I-395. This construction would not have been possible without a significant and inappropriate encroachment into the RPA. It is not known when, and by what regulatory standards, approval for land development with such an extensive encroachment was granted by the City of Alexandria. It is not known if a site-specific RPA determination was ever carried in the area in question. It is also not known if a plan for vegetative mitigation to offset the RPA encroachment was required of the DoD as a condition for development. There is no record of DEQ staff, either the Office of Environmental Review or the Office of Watersheds and Local Government Assistance Programs, ever receiving or reviewing the Mark Center project that led to the construction of the above-referenced buildings within the RPA buffer. It is important to note that, while the above RPA encroachment has no bearing on the current and proposed Mark Center project, an encroachment into the RPA of such magnitude, and as a result of major land development, would not have been considered at the time of review to be consistent with the Act and the Regulations.

Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in §9VAC25-830-130 and 140 of the Regulations, including the requirement to minimize land disturbance (including access and staging areas), retain existing vegetation and minimize impervious cover as well as including compliance with the requirements of the *Virginia Erosion and Sediment Control Handbook*, and stormwater management criteria

consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations*.” For land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook*.

Provided adherence to the above requirements, the currently proposed activities at the Pentagon and the Mark Center would be consistent with the *Chesapeake Bay Preservation Act* and the Regulations.

Re: NEW PROJECT DOD 2023 Pentagon Reservation Master Plan Update, DEQ 23-132F

Gavan, Larry (DEQ)

Wed 9/6/2023 10:50 AM

To: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

(a) Agency Jurisdiction. The Department of Environmental Quality (DEQ) administers the *Virginia Erosion and Sediment Control Law and Regulations (VESCL&R)* and *Virginia Stormwater Management Law and Regulations (VSWML&R)*.

(b) Erosion and Sediment Control and Stormwater Management Plans. The Applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and *VSWML&R*, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 1 acre (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VSWML&R*. Accordingly, the Applicant must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ Regional Office that serves the area where the project is located for review for compliance. The Applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [Reference: *VESCL 62.1-44.15 et seq.*]

(c) General Permit for Stormwater Discharges from Construction Activities (VAR10). DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The owner or operator of projects involving land-disturbing activities of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific Stormwater Pollution Prevention Plan. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the *VSMP Permit Regulations*.

[Reference: Virginia Stormwater Management Act 62.1-44.15 et seq.; VSMP Permit Regulations 9VAC25-880 et seq.]

Larry Gavan
Site Plan Review Coordinator

Office of Stormwater Management
Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, VA 23219
Work Number (804) 965-3320
larry.gavan@deq.virginia.gov



From: Fulcher, Valerie (DEQ) <Valerie.Fulcher@deq.virginia.gov>
Sent: Wednesday, September 6, 2023 9:07 AM
To: dgif-ESS Projects (DWR) <ESSProjects@dwr.virginia.gov>; DCR-PRR Environmental Review (DCR) <envreview@dcr.virginia.gov>; odwreview (VDH) <odwreview@vdh.virginia.gov>; Churchill, Nikolas (DEQ) <Nikolas.Churchill@deq.virginia.gov>; Ballou, Thomas (DEQ) <Thomas.Ballou@deq.virginia.gov>; Gavan, Larry (DEQ) <Larry.Gavan@deq.virginia.gov>; Moore, Daniel (DEQ) <Daniel.Moore@deq.virginia.gov>; Miller, Mark (DEQ) <Mark.Miller@deq.virginia.gov>; Kirchen, Roger (DHR) <Roger.Kirchen@dhr.virginia.gov>; MRC - Scoping (MRC) <Scoping@mrc.virginia.gov>; Lazaro, Robert (VDOT) <rlazaro@novaregion.org>; cphd@arlingtonva.us (cphd@arlingtonva.us) <cphd@arlingtonva.us>
Cc: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Subject: NEW PROJECT DOD 2023 Pentagon Reservation Master Plan Update, DEQ 23-132F

Good morning - this is a new OEIR review request/project:

Document Type: Environmental Assessment/Federal Consistency Determination
Project Sponsor: US Army Corps of Engineers
Project Title: 2023 Pentagon Reservation Master Plan Update **Location:**
Arlington County
Project Number: DEQ #23-132F

The document is available at <https://public.deq.virginia.gov/OEIR/> in the DOD folder. Additional information is attached.

The due date for comments is **OCTOBER 5, 2023**. You can send your comments either directly to **JULIA WELLMAN** by email (Julia.Wellman@deq.virginia.gov), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, P.O. Box 1105, Richmond, VA 23218.

NOTES: The FCD starts on PDF page 208 in Volume 2. The WHS Master Plan Project Maps and notes regarding them are attached.

If you cannot meet the deadline, please notify the project coordinator prior to the comment due date. Arrangements may be made to extend the deadline for comments if possible. An agency will be considered to have no concerns if comments are not received (or contact is made) within the review period. However, it is important that agencies consistently participate in accordance with Virginia Code Section 10.1-1192.

REVIEW INSTRUCTIONS:

- A. Please review the document carefully. If the proposal has been previously reviewed (e.g. as a draft EIS or a Part 1 EIR), please consider whether your earlier comments have been adequately addressed.**

- B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency (agency stationary or email) and include the project number on all correspondence.**

If you have any questions, please email Julia. Thanks!

Valerie

**Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior Department
of Environmental Quality
Environmental Enhancement - Office of Environmental Impact Review
1111 East Main Street
Richmond, VA 23219
NEW PHONE NUMBER: 804-659-1550
Email: Valerie.Fulcher@deq.virginia.gov
<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>**

**For program updates and public notices please subscribe to Constant
Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>**



COMMONWEALTH of VIRGINIA

Travis A. Voyles
*Secretary of Natural and
Historic Resources*

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director
Tel: (804) 367-2323
Fax: (804) 367-2391
www.dhr.virginia.gov

September 29, 2023

Julia Wellman
Dept. of Environmental Quality
Office of Environmental Impact Review
P.O. Box 1105
Richmond, VA 23218

Re: 2023 Pentagon Reservation Master Plan Update
Arlington, VA
DHR File No. 2011-1191
DEQ # 23-132F

Dear Ms. Wellman

We have received your request for comments on the project referenced above. Our comments are provided as assistance to the Virginia Department of Environmental Quality (DEQ).

DHR has been in direct consultation with the Department of Defense and its agents/contractors regarding this project and reached consensus that 2023 Pentagon Reservation Master Plan Update will result in no adverse effects to historic properties. Per Section 106 of the National Historic Preservation Act, the DOD will continue consult with DHR on individual projects that are discussed in the Master Plan updates. DHR has no further comment at this time.

If you have any questions, please contact me at jennifer.bellville-marrion@dhr.virginia.gov.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jenny Bellville-Marrion".

Jenny Bellville-Marrion, Project Review Archaeologist
Review and Compliance Division

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

RE: NEW PROJECT DOD 2023 Pentagon Reservation Master Plan Update, DEQ 23-132F

Warren, Arlene (VDH)

Mon 9/18/2023 2:47 PM

To: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

Cc: Environmental Impact Review (DEQ) <eir@deq.virginia.gov>

Project #: 23-132F**Project Name: 2023 Pentagon Reservation Master Plan Update**

UPC #: N/A

Location: Arlington County

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems **must be verified by the local utility**.

There are no public groundwater wells within a 1-mile radius of the project site.

There are no surface water intakes located within a 5-mile radius of the project site.

The project is not within the watershed of any public surface water intakes.

There are no apparent impacts to public drinking water sources due to this project.

The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.

Best Regards,**Arlene F. Warren**

GIS Program Support Technician

Mobile 804-389-2167 (office/cell/text)**Email** [arlene.warren@vdh.virginia.gov] arlene.warren@vdh.virginia.gov

VDH, Office of Drinking Water

109 Governor Street, 6th Floor

Richmond, VA 23219

From: Fulcher, Valerie (DEQ) <Valerie.Fulcher@deq.virginia.gov>**Sent:** Wednesday, September 6, 2023 9:08 AM**To:** dgif-ESS Projects (DWR) <ESSProjects@dwr.virginia.gov>; DCR-PRR Environmental Review (DCR) <envreview@dcr.virginia.gov>; odwreview (VDH) <odwreview@vdh.virginia.gov>; Churchill, Nikolas (DEQ) <Nikolas.Churchill@deq.virginia.gov>; Ballou, Thomas (DEQ) <Thomas.Ballou@deq.virginia.gov>; Gavan, Larry (DEQ) <Larry.Gavan@deq.virginia.gov>; Moore, Daniel (DEQ) <Daniel.Moore@deq.virginia.gov>; Miller, Mark (DEQ) <Mark.Miller@deq.virginia.gov>; Kirchen, Roger (DHR) <Roger.Kirchen@dhr.virginia.gov>; MRC - Scoping (MRC) <Scoping@mrc.virginia.gov>; Lazaro, Robert (VDOT) <rlazaro@novaregion.org>; cphd@arlingtonva.us <cphd@arlingtonva.us>**Cc:** Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>**Subject:** NEW PROJECT DOD 2023 Pentagon Reservation Master Plan Update, DEQ 23-132F

Good morning - this is a **new OEIR review request/project:**

Document Type: Environmental Assessment/Federal Consistency Determination

Project Sponsor: US Army Corps of Engineers

Project Title: 2023 Pentagon Reservation Master Plan Update

Location: Arlington County

Project Number: DEQ #23-132F

The document is available at <https://public.deq.virginia.gov/OEIR/> in the **DOD** folder. Additional information is attached.

The due date for comments is **OCTOBER 5, 2023**. You can send your comments either directly to **JULIA WELLMAN** by email (Julia.Wellman@deq.virginia.gov), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, P.O. Box 1105, Richmond, VA 23218.

NOTES: The FCD starts on PDF page 208 in Volume 2. The WHS Master Plan Project Maps and notes regarding them are attached.

If you cannot meet the deadline, please notify the project coordinator prior to the comment due date. Arrangements may be made to extend the deadline for comments if possible. An agency will be considered to have no concerns if comments are not received (or contact is made) within the review period. However, it is important that agencies consistently participate in accordance with Virginia Code Section 10.1-1192.

REVIEW INSTRUCTIONS:

- A. Please review the document carefully. If the proposal has been previously reviewed (e.g. as a draft EIS or a Part 1 EIR), please consider whether your earlier comments have been adequately addressed.**
- B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency (agency stationary or email) and include the project number on all correspondence.**

If you have any questions, please email Julia. Thanks!

Valerie

Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

NEW PHONE NUMBER: 804-659-1550

Email: Valerie.Fulcher@deq.virginia.gov

<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>

For program updates and public notices please subscribe to Constant Contact:

<https://lp.constantcontact.com/su/MVcCump/EIR>

Travis A. Voyles
Secretary of Natural and Historic Resources

Matthew S. Wells
Director

Andrew W. Smith
Chief Deputy Director



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Frank N. Stovall
Deputy Director
for Operations

Darryl Glover
Deputy Director for
Dam Safety,
Floodplain Management and
Soil and Water Conservation

Laura Ellis
Deputy Director for
Administration and Finance

MEMORANDUM

DATE: October 3, 2023
TO: Julia Wellman
FROM: Allison Tillett, Environmental Impact Review Coordinator
SUBJECT: DEQ 23-132F, 2023 Pentagon Reservation Master Plan Update

Division of Planning and Recreation Resources

The Department of Conservation and Recreation (DCR), Division of Planning and Recreational Resources (PRR), develops the *Virginia Outdoors Plan* and coordinates a broad range of recreational and environmental programs throughout Virginia. These include the Virginia Scenic Rivers program; Trails, Greenways, and Blueways; Virginia State Park Master Planning and State Park Design and Construction. PRR also administers the Land & Water Conservation Fund (LWCF) program in Virginia.

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Pentagon Site, Mark Center Site

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed <https://services.dwr.virginia.gov/fwis/> or contact Amy Martin at 804-367-2211 or amy.martin@dwr.virginia.gov.

Division of State Parks

DCR's Division of State Parks is responsible for acquiring and managing, state parks. Park development and master planning are managed by the Division of Planning and Recreation Resources. Master plans are required prior to a parks opening and are updated every ten years (Virginia Code § 10.1-200 *et seq.*).

Division of Dam Safety and Floodplain Management

Dam Safety Program:

The Dam Safety program was established to provide proper and safe design, construction, operation and maintenance of dams to protect public safety. Authority is bestowed upon the program according to *The Virginia Dam Safety Act*, Article 2, Chapter 6, Title 10.1 (10.1-604 *et seq.*) of the Code of Virginia and Dam Safety Impounding Structure Regulations (Dam Safety Regulations), established and published by the Virginia Soil and Water Conservation Board (VSWCB).

Floodplain Management Program:

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

All development within a Special Flood Hazard Area (SFHA), as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.

State Agency Projects Only

[Executive Order 45](#), signed by Governor Northam and effective on November 15, 2019, establishes mandatory standards for development of state-owned properties in Flood-Prone Areas, which include Special Flood Hazard Areas, Shaded X Zones, and the Sea Level Rise Inundation Area. These standards shall apply to all state agencies.

1. Development in Special Flood Hazard Areas and Shaded X Zones
 - A. All development, including buildings, on state-owned property shall comply with the locally-adopted floodplain management ordinance of the community in which the state-owned property is located and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
 - B. If any state-owned property is located in a community that does not participate in the NFIP, all development, including buildings, on such state-owned property shall comply with the NFIP requirements as defined in 44 CFR §§ 60.3, 60.4, and 60.5 and any flood-related standards identified in the Virginia Uniform Statewide Building Code.

- (1) These projects shall be submitted to the Department of General Services (DGS), for review and approval.
 - (2) DGS shall not approve any project until the State NFIP Coordinator has reviewed and approved the application for NFIP compliance.
 - (3) DGS shall provide a written determination on project requests to the applicant and the State NFIP Coordinator. The State NFIP Coordinator shall maintain all documentation associated with the project in perpetuity.
- C. No new state-owned buildings, or buildings constructed on state-owned property, shall be constructed, reconstructed, purchased, or acquired by the Commonwealth within a Special Flood Hazard Area or Shaded X Zone in any community unless a variance is granted by the Director of DGS, as outlined in this Order.

The following definitions are from Executive Order 45:

Development for NFIP purposes is defined in 44 CFR § 59.1 as “Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.”

The Special Flood Hazard Area may also be referred to as the 1% annual chance floodplain or the 100-year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study. This includes the following flood zones: A, AO, AH, AE, A99, AR, AR/AE, AR/AO, AR/AH, AR/A, VO, VE, or V.

The Shaded X Zone may also be referred to as the 0.2% annual chance floodplain or the 500- year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study.

The Sea Level Rise Inundation Area referenced in this Order shall be mapped based on the National Oceanic and Atmospheric Administration Intermediate-High scenario curve for 2100, last updated in 2017, and is intended to denote the maximum inland boundary of anticipated sea level rise.

“State agency” shall mean all entities in the executive branch, including agencies, offices, authorities, commissions, departments, and all institutions of higher education.

“Reconstructed” means a building that has been substantially damaged or substantially improved, as defined by the NFIP and the Virginia Uniform Statewide Building Code.

Federal Agency Projects Only

Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

DCR’s Floodplain Management Program does not have regulatory authority for projects in the SFHA. The applicant/developer must reach out to the local floodplain administrator for an official floodplain determination and comply with the community’s local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality. For state projects, DCR recommends that compliance documentation be provided prior to the project being funded. For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community’s local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS):

www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.



MEMORANDUM

TO: Julia Wellman, DEQ/EIR Environmental Program Planner

FROM: Nikolas I. Churchill, Division of Land Protection & Revitalization Review Coordinator

DATE: September 27, 2023

COPIES: Sanjay Thirunagari, Division of Land Protection & Revitalization Review Manager; file

SUBJECT: Environmental Impact Review: 23-132F 2023 Pentagon Reservation Master Plan Update in Arlington County, Virginia.

The Division of Land Protection & Revitalization (DLPR) has completed its review of the US Army Corps of Engineers' September 6, 2023 EIR for 23-132F 2023 Pentagon Reservation Master Plan Update in Arlington County, Virginia.

DLPR staff conducted a search (200 ft. radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area. DLPR identified three (3) RCRA small quantity generators, one (1) solid waste permitted facility, two (2) VRP sites, and fourteen (14) petroleum release sites within the project area which might impact the project.

DLPR staff has reviewed the submittal and offers the following comments:

Hazardous Waste/RCRA Facilities – Three (3) found in close proximity to the project area.

- 1. Registry ID 110071228883, Target Store T3430, 900 ARMY NAVY DR, STE A2, Arlington, VA 22202, Small Quantity Generator, Active Status: Y**
- 2. Registry ID 110063002236, PENTAGON RESERVATION, 1 NOTARY RD, Arlington, VA 22211, Small Quantity Generator, Active Status: Y**
- 3. Registry ID 110005255213, DOUBLETREE HOTEL, 300 ARMY NAVY DR, Arlington, VA 22202, Small Quantity Generator, Active Status: Y**

CERCLA Sites – none in close proximity to the project area.

Formerly Used Defense Sites (FUDS) – none in close proximity to the project area.

Solid Waste – One (1) found in close proximity to the project area.

1. ***Solid Waste Permit (Daily): PMT ID: 900000002569, US Dept. of Defense – Pentagon SW Incinerator, 425 Old Jefferson Davis Hwy, Arlington, VA 22202, Permit Operating Status: Active***

Virginia Remediation Program (VRP) – Two (2) found in close proximity to the project area.

1. ***VRP01046, Pen Place, 550 Army Navy Dr, Arlington, VA 22202, Primary Status: Enrolled in Program***
2. ***VRP00036, Pentagon Heating and Cooling, Arlington, VA 22211, Primary Status: Pre-VRP***

Petroleum Releases – Fourteen (14) found in close proximity to the project area.

1. ***PC Number 19983629, Radisson Hotel, 5000 Seminary Rd, Alexandria, Virginia, Release Date: 12/15/1997, Status: Closed.***
2. ***PC Number 20063081, Hilton Alexandria Mark Center, 5000 Seminary Rd, Alexandria, Virginia, Release Date: 10/10/2005, Status: Closed.***
3. ***PC Number 19973031, 400 Army Navy Drive Site, 400 Army Navy Dr, Arlington, Virginia, Release Date: 09/05/1996, Status: Closed***
4. ***PC Number 20223030, Pen Place, 12th & South Eads Street, Arlington, Virginia, Release Date: 09/09/2021, Status: Closed***
5. ***PC Number 19921701, Pentagon Heating and Refrigeration Plant, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 02/24/1992, Status: Closed***
6. ***PC Number 20223069, Heating and Refrigeration Plant – Pentagon, 1155 Defense Pentagon Rm MF737, Washington DC, District of Columbia, Release Date: 11/17/2021, Status: Closed***
7. ***PC Number 19954089, Pentagon Building, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 10/16/1994, Status: Closed***
8. ***PC Number 19920521, Pentagon – Motor Pool Gas Station, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 09/16/1991, Status: Closed***
9. ***PC Number 19940808, Pentagon River Entrance, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 11/08/1993, Status: Closed***
10. ***PC Number 19944296, Pentagon Courtyard, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 06/13/1994, Status: Closed***
11. ***PC Number 19973203, Pentagon Bell Atlantic, Pentagon, Arlington, Virginia, Release Date: 06/05/1997, Status: Closed***
12. ***PC Number 19910522, Bell Atlantic – Pentagon, Pentagon, Arlington, Virginia, Release Date: 10/08/1990, Status: Closed***

- 13. PC Number 19901475, Pentagon Sewage Pump Station, 425 Old Jefferson Davis Hwy, Arlington, Virginia, Release Date: 04/29/1990, Status: Closed**
14. PC Number 20073077, Arlington National Cemetery Pump House, Boundary Channel Dr, Arlington, Virginia, Release Date: 08/23/2006, Status: Closed

Please note that the DEQ's Pollution Complaint (PC) cases identified should be further evaluated by the project engineer or manager to establish the exact location, nature and extent of the petroleum release and the potential to impact the proposed project. In addition, the project engineer or manager should contact the DEQ's Northern Regional Office at (703) 583-3800 (Tanks Program) for further information about the PC cases.

PROJECT SPECIFIC COMMENTS

None

GENERAL COMMENTS

Soil, Sediment, Groundwater, and Waste Management

Any soil, sediment or groundwater that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Part 107.

Asbestos and/or Lead-based Paint

All structures being demolished/renovated/removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-81-620 for ACM and 9VAC 20-60-261 for LBP must be followed. Questions may be directed to the DEQ's Northern Regional Office at (703) 583-3800.

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Nikolas Churchill by phone at (804) 659-2663 or email nikolas.churchill@deq.virginia.gov.



COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Travis A. Voyles
Secretary of Natural and Historic
Resources

Jamie L. Green
Commissioner

October 5, 2023

Department of Environmental Quality
Attn: Julia Wellman
1111 East Main Street
Richmond, VA 23219

Re: Federal Consistency Determination, DoD 2023 Pentagon
Reservation Master Plan Update, DEQ #23-132F

Dear Ms. Wellman:

This will respond to the request for comments regarding the Federal Consistency Determination for the 2023 Pentagon Reservation Master Plan Update (DEQ #23-132F), prepared by Washington Headquarters Services, on behalf of the Department of Defense (DoD). Specifically, the DoD has proposed several construction activities related to stormwater management, vehicular and pedestrian circulation and access, and improvements to existing security facilities and Pentagon infrastructure. The project(s) will be located within the Pentagon campus adjacent to the Potomac River in Arlington, Virginia and the Mark Center in Alexandria, Virginia.

We reviewed the provided documents and determined that the proposal does not impact resources within the jurisdiction of the Virginia Marine Resources Commission (VMRC) and will not require a permit from this agency.

Please be advised that the VMRC pursuant to Chapters 12, 13, and 14 of Title 28.2 of the Code of Virginia administers permits required for proposed impacts to submerged lands, tidal wetlands, and beaches and dunes. The VMRC administers the enforceable policies of fisheries management, subaqueous lands, tidal wetlands, and coastal primary sand dunes and beaches, which comprise some of Virginia's Coastal Zone Management Program. VMRC staff has reviewed the submittal and offers the following comments:

Fisheries and Shellfish: none in close proximity to the project area

Submerged Lands: none in close proximity to the project area

Tidal Wetlands: none in close proximity to the project area

Beaches and Coastal Primary Sand Dunes: none in close proximity to the project area

As such, this project has no foreseeable impact on the VMRC's enforceable policies. As proposed, we have no objection to the consistency findings provided by the applicant. Should the proposed project

An Agency of the Natural and Historic Resources Secretariat

www.mrc.virginia.gov

Telephone (757) 247-2200 Information and Emergency Hotline 1-800-541-4646

Department of Environmental Quality
October 5, 2023
Page Two

change, a new review by this agency may be required relative to these jurisdictional areas.

Please contact me at (757) 247-2255 or by email at mike.johnson@mrc.virginia.gov if you have any questions. Thank you for the opportunity to comment.

Sincerely,



Mike Johnson
Environmental Engineer, Habitat Management

MJ/dd
HM

September 15, 2023

SENT VIA EMAIL: joseph.d.eichenlaub.civ@mail.mil

Joe Eichenlaub
WHS/Facilities Services Directorate/Standards and
Compliance Division/Environmental and Sustainability Branch
Department of Defense, Washington Headquarters Services (WHS)

RE: Draft EA for the 2023 Pentagon Reservation Master Plan Update Review (July 31, 2023)

Dear Mr. Eichenlaub:

Arlington County is pleased to have the opportunity to review the **Draft Submittal of the EA for the 2023 Pentagon Reservation Master Plan Update (July 31, 2023)**. Planning Division staff in the Department of Community Planning, Housing and Development (CPHD), as well as Transportation Planning & Capital Project Management (TPCPM) Bureau and Environmental Management Bureau staff in the Department of Environmental Services (DES) have assessed the submitted material. Based on our review, detailed staff comments can be found in Appendix 1 – Additional Comments Matrix at the end of this letter. Kindly note that Arlington County staff have also reviewed an earlier draft of the Pentagon Reservation Master Plan Update (July 5, 2023, version), based on a request sent from the National Capital Planning Commission (NCPC) on July 11, 2023. The review included comments from other departments, such as the Department of Parks and Recreation (DPR) and was submitted to NCPC on September 5, 2023. Several of the comments from all Arlington County departments remain relevant to the EA assessment so they are included here as part of Arlington County's response to the Draft EA for the 2023 Pentagon Reservation Master Plan Update, both in the text below and as part of Appendix 1.

Crystal City Sector Plan, Pentagon City Sector Plan and Pentagon Centre Phased Development Site Plan (PDSP): Arlington County staff recognize the respective areas of the [Crystal City Sector Plan \(2010\)](#), [Pentagon City Sector Plan \(2022\)](#) and [Pentagon Centre Phased Development Site Plan \(PDSP\)\(2015\)](#) are distinct from the Pentagon Reservation boundaries. As the general land use pattern surrounding the Pentagon site has remained largely unchanged since the 2016 Pentagon Reservation Master Plan Update, staff does not detect any land use implications with the subject (2023) Reservation Plan. However, staff recommends considering the design guidelines in both Pentagon City and Crystal City Plans, to enable creating linkages between these planned areas and those subject to the Pentagon Master Plan, which would improve consistency throughout the area. Most notably, public access corridors recently identified in the Pentagon City Sector Plan have the potential to transform the area's large parcels into a high-value, mixed-use, multi-modal district, while supporting active edges along primary pedestrian streets and walkways. Staff therefore encourages consideration of adopting similar guidelines related to biophilic design and emphasizing pedestrian networks.

These initiatives, along with the County's investments into transit and micro-mobility, will ensure the surrounding areas can effectively incentivize various modes of travel for Pentagon's visitors and employees. While technically outside of the core preservation area, consideration of new land uses for the surface parking areas south of I-395 presents a great opportunity to identify how those parcels could be repurposed to better support the adjacent growth anticipated in Pentagon City and Crystal City. Staff also encourages considering the potential to establish a tree canopy target for the campus responsive to the Pentagon's Environmental Protection and Sustainability goals, noting the Pentagon City's Sector Plan's target of at least 20 percent tree canopy on the site and its surrounding streetscape environments as a point of reference.

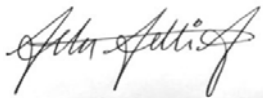
[Public Spaces Master Plan \(PSMP\)](#) and [Forestry and Natural Resources Plan \(draft\) \(FNRP\)](#): Arlington County staff are supportive of the draft Pentagon Reservation Master Plan's proposed recommendations for the expansion of green spaces, biophilic design, tree planting, adding native plants, and proposing stormwater infrastructure and public spaces. Staff notes areas to consider when finalizing the Plan in Appendix 1.

Historic and Cultural Resources Considerations: Arlington County staff recognizes that changes to the facilities should blend in with Pentagon's architectural qualities and respect historic design standards. Such changes should note the material, design motifs and impacts of development on historic features and should emphasize the importance of highlighting the disparities and the displacement of African American communities in the County. Please see Appendix 1 for detailed staff comments on how the Plan should refine this section to incorporate the full picture of this period.

Multimodal Transportation Improvements: Arlington County staff are supportive of the Plan's proposed multimodal travel improvements between the Pentagon and the surrounding streets and trails. TPCPM staff have been coordinating with the Pentagon on multiple transportation projects adjacent to the Pentagon Reservation property. Please see Appendix 1 for technical staff comments on transportation and circulation impacts within the Pentagon Reservation boundaries.

Thank you for the opportunity to review the draft Pentagon Reservation Master Plan Update. Arlington County looks forward to a continued cooperative relationship with the Pentagon and NCPC.

Sincerely,



Anthony Fusarelli, Jr., AICP
Planning Director

CC: Claude Williamson, Director, Department of Community Planning, Housing and Development (CPHD)
Shannon Flanagan-Watson, Deputy County Manager, County Manager's Office, (CMO)
Jennifer Smith, Comprehensive Planning Manager, CPHD
Kellie Brown, Comprehensive Planning Section Supervisor, CPHD

Appendix 1: Additional Comments Matrix of Arlington County

Department of Community Planning, Housing and Development – Planning Division		
Page	Text	Comment
Volume 1: Page 2-10	The Pentagon Master Plan also increases green space on the Pentagon site by 7.5 percent. Refer to Section 3.7 (Environment and Sustainability Projects) in the Pentagon Master Plan for additional information.	Staff also encourages studying the potential to establish a tree canopy target for the campus responsive to the Pentagon’s Environmental Protection and Sustainability goals, noting the Pentagon City’s Sector Plan’s target of at least 20 percent tree canopy on the site and its surrounding streetscape environments as a point of reference.
Volume 2: Appendix A	N/A	This version of the Pentagon Reservation Master Plan Update (August 2023) had several errors related to referencing table and figure numbers (see examples in pages 2-45, 2-47, 2-52), as well as redactions that were not part of the earlier version received from NCPC, dated July 5, 2023 (see examples in pages 2-51, 3-25). Furthermore, some of the tables in this version had the last item missing consistently in each table so not sure if this was an error due to redesigning the table layout (see examples in page ES-5 (Tables ES-2- ES-5), page 2-3, and page 3-24 (Table 3-1 total is missing in this August 2013 version in comparison to the July version received by NCPC for review).
Appendix A: 2-49	100 percent carbon-pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon-pollution-free electricity	Is this goal achievable in six (6) years?
Appendix A: 3-8	Mixed-Use/Support: This category has been created to reflect a land use pattern that may contain a mixture of uses, including private development and Support as the primary functions. These areas could also include green space and public transportation uses integrated into a development.	As this section elaborates on an additional study recommended to determine the most appropriate mix of uses based upon constructability, it is important to note that the Pentagon City Sector Plan identifies “new public access corridors needed to transform the area’s large parcels into a high-value, mixed-use, multi-modal district” and creating linkages between these corridors and mixed-uses leading to the Pentagon.

Department of Parks and Recreation (DPR)		
Page	Text	Comment
Appendix A: General Comment	Tree Canopy and Green Infrastructure	Consider using Arlington County’s recommended tree lists when selecting trees for the site:

		https://www.arlingtonva.us/Government/Programs/Sustainability-and-Environment/Trees/Plant-Trees/Recommended-Trees Consider alternatives to the “Tree filter” bioretention, such as larger bioretention facilities, as the County has seen poor performance of trees in those facilities. Consider using small/medium shrubs instead of trees, where space is limited.
Appendix A: General Comment	Public Spaces	The plan uses an outdated rendering image for Long Bridge Aquatics Center. DPR can provide a correct image, if requested. Please contact Ryan Delaney for any questions/inquiries at rdelaney@arlingtonva.us
Appendix A: General Comment	Bicycle/Pedestrian/Trail Connectivity	Please include a reference to the Green Ribbon connection at South Eads Street detailed in Section 3.6.1 - Pentagon South Pedestrian Safety Project and South East Parking Project of the Pentagon City Sector Plan (page 115).

Department of Environmental Services (DES) - Transportation Division		
Page	Text	Comment
General	N/A	Please continue planned coordination with the Arlington County Department of Environmental Services, Transportation Division, and/or VDOT, on short-term and long-term projects identified in the master plan update and draft EA that make changes to the transportation network and associated land use, including: <ul style="list-style-type: none"> - Army-Navy Drive Offsite Parking Lots Feasibility Study (long-term) - Pentagon South Pedestrian Safety Project (short-term) - North Parking Lot Improvements Project (short-term) - Southeast Parking Project (short-term) - Connector Road and Boundary Channel Drive Intersection Improvements Project (short-term) - Connector Road Bridge Upgrades (short-term)
Page 3-31	In addition to two high occupancy vehicle (HOV) lanes and several feeder lanes between ramps, I 395 contains four to five lanes in either direction.	The I-395 lanes are High Occupancy Toll (HOT) lanes in this location.

Page 3-32	Richmond Highway (SR 110) is a 2.41-mile freeway stretching from Crystal City to Rosslyn.	Suggested Edit: replace freeway with Limited-Access Route as described in Arlington’s Master Transportation Plan Map. Suggested Edit: <i>connects U. S. Route 1 in Crystal City to I-66 in Rosslyn. Many people associate Richmond Highway as U. S. Route 1 in Crystal City.</i>
Page 3-32	Richmond Highway was formerly named Jefferson Davis Highway until October 2019.	Recommended Edit: Richmond Highway, formerly Jefferson Davis Highway, was renamed by Arlington County in October 2019.
Page 3-32	Washington Boulevard (SR 27)	Should there be a reference to what it connects to – Clarendon?
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Appendix A: 2-15	Table of projects	Add the Army Navy Drive Complete Street Project to this list as ‘under construction’ Add The Arlington Memorial Trail to this list as ‘planned’
Appendix A: 2-31	The Pentagon is located in the vicinity of a number of major regional commuter roadways that provide access to points within Washington, DC, and northern Virginia	Delete ‘commuter’ – these roadways provide important access at all times.

Appendix A: 2-33	Narrow sidewalks, including at the pedestrian tunnel exit, cause pedestrians to stand in vehicle travel lanes.	Replace 'stand' with 'walk'
Appendix A: 2-35	The Pentagon campus has two rideshare programs.	Mention significant rideshare programs available to Pentagon employees managed by Arlington County Commuter Services. Recommended edit: "In addition to public rideshare services managed by Arlington County Commuter Services, the Pentagon campus has two rideshare programs."
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Department of Community Planning, Housing & Development (CPHD) - Neighborhood Services Division		
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Appendix A: 2-6	Section 2.1.2 Historic and Cultural Resources	<ol style="list-style-type: none"> 1. Speaks to the federal government's use of eminent domain to seize East Arlington and Queen City and African American communities that had evolved from the former Freedman's Village, which was established in 1863 by the federal government to house displaced and formerly enslaved people. 2. While this historic context on how the construction of the Pentagon caused major disruption to these local communities is important, staff suggests more details concerning the poor treatment of African American communities in relation to the provision of inadequate temporary housing, how that impacted nearby African

		<p>American communities like Johnson’s Hill (now referred to as a Arlington View), and what the community accomplished to rebound from these setbacks, such as the creation of the Arlington County’s Neighborhood Conservation Program (now named the Arlington Neighborhoods Program).</p> <p>3. Staff suggests utilizing Arlington County’s A Guide to the African American Heritage of Arlington County (reference pages 3, 45-47, 49 and 53) and emphasizes the importance of transparency and how these residents were compelled to accept the government’s offer of temporary accommodations, as no other housing options being available.</p> <p>4. Providing an understanding of what these communities included would be beneficial. For instance, constructed in 1930, the Mount Zion Baptist Church was demolished, and the federal government dumped refuse from the construction of the Pentagon in the ravines of Johnson’s Hill, a nearby African American community. Staff encourages refinement of this section of the plan to incorporate the full picture of this history.</p> <p>Please contact Lorin Farris for any questions/inquiries at lfarris@arlingtonva.us.</p>
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RE: NEW PROJECT DOD 2023 Pentagon Reservation Master Plan Update, DEQ 23-132F

Jason Papacosma <Jpapacosma@arlingtonva.us>

Thu 9/21/2023 3:00 PM

To: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>

Cc: Fulcher, Valerie (DEQ) <Valerie.Fulcher@deq.virginia.gov>

■ 1 attachments (307 KB)

EA for Pentagon Master Plan_20230915.pdf;

Ms. Wellman - Thank you for sharing the Draft EA for the 2023 Pentagon Reservation Master Plan Update (July 31, 2023) with Arlington County. The County also received the Draft EA for review through other channels and submitted the attached comments on September 15, 2023.

Your email also pointed us specifically to review the Federal Consistency Determination for the Coastal Zone Management Act in Appendix B. We have reviewed these materials and do not have substantive comments. The FCD outlines four main considerations that support a net improvement in water quality through the implementation of the Master Plan:

- No direct disturbance within the Resource Protection Area (RPA) buffer.
- Implementation of erosion and sediment controls during construction.
- Net increase in permeable surfaces and reduction in impervious surfaces overall.
- Adding stormwater management controls for future development activities on the Reservation.

Consistent with past and present practice, Arlington County requests that DOD follow Arlington County's requirements for regulated land disturbing activities, including procedures for reviewing potential RPA impacts. Details can be found here:

[Land Disturbing Activity / Stormwater Permit Overview – Official Website of Arlington County Virginia Government \(arlingtonva.us\)](https://www.arlingtonva.us/government/land-disturbing-activity-stormwater-permit-overview)

[Resource Protection Area Requirements – Official Website of Arlington County Virginia Government \(arlingtonva.us\)](https://www.arlingtonva.us/government/resource-protection-area-requirements)

Thank you again for including Arlington County in your distribution of the Draft EA. If you have any questions or need additional information, please don't hesitate to contact me.

Sincerely,

Jason Papacosma

Watershed Programs Manager

Arlington County Dept. of Environmental Services

Office of Sustainability and Environmental Management

2100 Clarendon Blvd., Suite 705

Arlington, VA 22201

P: 703-228-3613
F: 703-228-7134
E: jpapacosma@arlingtonva.us

Delivering Arlington County's regulatory and stewardship programs for water quality and stream health and resiliency

[Stormwater Management – Official Website of Arlington County Virginia Government \(arlingtonva.us\)](http://arlingtonva.us)

Please note that any email sent to/from Arlington County email addresses may be subject to disclosure under the Freedom of Information Act (FOIA).



From: Fulcher, Valerie (DEQ) <Valerie.Fulcher@deq.virginia.gov>
Sent: Wednesday, September 6, 2023 9:08 AM
To: dgif-ESS Projects (DWR) <ESSProjects@dwr.virginia.gov>; DCR-PRR Environmental Review (DCR) <envreview@dcr.virginia.gov>; odwreview (VDH) <odwreview@vdh.virginia.gov>; Churchill, Nikolas (DEQ) <Nikolas.Churchill@deq.virginia.gov>; Ballou, Thomas (DEQ) <Thomas.Ballou@deq.virginia.gov>; Gavan, Larry (DEQ) <Larry.Gavan@deq.virginia.gov>; Moore, Daniel (DEQ) <Daniel.Moore@deq.virginia.gov>; Miller, Mark (DEQ) <Mark.Miller@deq.virginia.gov>; Kirchen, Roger (DHR) <Roger.Kirchen@dhr.virginia.gov>; MRC - Scoping (MRC) <Scoping@mrc.virginia.gov>; Lazaro, Robert (VDOT) <rlazaro@novaregion.org>; CPHD <cphd@arlingtonva.us>
Cc: Wellman, Julia (DEQ) <Julia.Wellman@deq.virginia.gov>
Subject: NEW PROJECT DOD 2023 Pentagon Reservation Master Plan Update, DEQ 23-132F

You don't often get email from valerie.fulcher@deq.virginia.gov. [Learn why this is important](#)

EXTERNAL EMAIL

CAUTION: This email contains file attachments. Do NOT open files that you are not expecting to receive, even from known senders.

Good morning - this is a new OEIR review request/project:

Document Type: Environmental Assessment/Federal Consistency Determination
Project Sponsor: US Army Corps of Engineers
Project Title: 2023 Pentagon Reservation Master Plan Update Location:
Arlington County
Project Number: DEQ #23-132F

The document is available at <https://public.deq.virginia.gov/OEIR/> in the **DOD** folder. Additional information is attached.

The due date for comments is **OCTOBER 5, 2023**. You can send your comments either directly to **JULIA WELLMAN** by email (Julia.Wellman@deq.virginia.gov), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, P.O. Box 1105, Richmond, VA 23218.

NOTES: The FCD starts on PDF page 208 in Volume 2. The WHS Master Plan Project Maps and notes regarding them are attached.

If you cannot meet the deadline, please notify the project coordinator prior to the comment due date. Arrangements may be made to extend the deadline for comments if possible. An agency will be considered to have no concerns if comments are not received (or contact is made) within the review period. However, it is important that agencies consistently participate in accordance with Virginia Code Section 10.1-1192.

REVIEW INSTRUCTIONS:

- A. Please review the document carefully. If the proposal has been previously reviewed (e.g. as a draft EIS or a Part 1 EIR), please consider whether your earlier comments have been adequately addressed.
- B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency (agency stationary or email) and include the project number on all correspondence.

If you have any questions, please email Julia.

Thanks!

Valerie

Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

NEW PHONE NUMBER: 804-659-1550

Email: Valerie.Fulcher@deq.virginia.gov

<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>

For program updates and public notices please subscribe to Constant

Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>

September 15, 2023

SENT VIA EMAIL: joseph.d.eichenlaub.civ@mail.mil

Joe Eichenlaub
WHS/Facilities Services Directorate/Standards and
Compliance Division/Environmental and Sustainability Branch
Department of Defense, Washington Headquarters Services (WHS)

RE: Draft EA for the 2023 Pentagon Reservation Master Plan Update Review (July 31, 2023)

Dear Mr. Eichenlaub:

Arlington County is pleased to have the opportunity to review the **Draft Submittal of the EA for the 2023 Pentagon Reservation Master Plan Update (July 31, 2023)**. Planning Division staff in the Department of Community Planning, Housing and Development (CPHD), as well as Transportation Planning & Capital Project Management (TPCPM) Bureau and Environmental Management Bureau staff in the Department of Environmental Services (DES) have assessed the submitted material. Based on our review, detailed staff comments can be found in Appendix 1 – Additional Comments Matrix at the end of this letter. Kindly note that Arlington County staff have also reviewed an earlier draft of the Pentagon Reservation Master Plan Update (July 5, 2023, version), based on a request sent from the National Capital Planning Commission (NCPC) on July 11, 2023. The review included comments from other departments, such as the Department of Parks and Recreation (DPR) and was submitted to NCPC on September 5, 2023. Several of the comments from all Arlington County departments remain relevant to the EA assessment so they are included here as part of Arlington County's response to the Draft EA for the 2023 Pentagon Reservation Master Plan Update, both in the text below and as part of Appendix 1.

Crystal City Sector Plan, Pentagon City Sector Plan and Pentagon Centre Phased Development Site Plan (PDSP): Arlington County staff recognize the respective areas of the [Crystal City Sector Plan \(2010\)](#), [Pentagon City Sector Plan \(2022\)](#) and [Pentagon Centre Phased Development Site Plan \(PDSP\)\(2015\)](#) are distinct from the Pentagon Reservation boundaries. As the general land use pattern surrounding the Pentagon site has remained largely unchanged since the 2016 Pentagon Reservation Master Plan Update, staff does not detect any land use implications with the subject (2023) Reservation Plan. However, staff recommends considering the design guidelines in both Pentagon City and Crystal City Plans, to enable creating linkages between these planned areas and those subject to the Pentagon Master Plan, which would improve consistency throughout the area. Most notably, public access corridors recently identified in the Pentagon City Sector Plan have the potential to transform the area's large parcels into a high-value, mixed-use, multi-modal district, while supporting active edges along primary pedestrian streets and walkways. Staff therefore encourages consideration of adopting similar guidelines related to biophilic design and emphasizing pedestrian networks.

These initiatives, along with the County's investments into transit and micro-mobility, will ensure the surrounding areas can effectively incentivize various modes of travel for Pentagon's visitors and employees. While technically outside of the core preservation area, consideration of new land uses for the surface parking areas south of I-395 presents a great opportunity to identify how those parcels could be repurposed to better support the adjacent growth anticipated in Pentagon City and Crystal City. Staff also encourages considering the potential to establish a tree canopy target for the campus responsive to the Pentagon's Environmental Protection and Sustainability goals, noting the Pentagon City's Sector Plan's target of at least 20 percent tree canopy on the site and its surrounding streetscape environments as a point of reference.

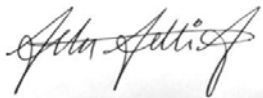
[Public Spaces Master Plan \(PSMP\)](#) and [Forestry and Natural Resources Plan \(draft\) \(FNRP\)](#): Arlington County staff are supportive of the draft Pentagon Reservation Master Plan's proposed recommendations for the expansion of green spaces, biophilic design, tree planting, adding native plants, and proposing stormwater infrastructure and public spaces. Staff notes areas to consider when finalizing the Plan in Appendix 1.

Historic and Cultural Resources Considerations: Arlington County staff recognizes that changes to the facilities should blend in with Pentagon's architectural qualities and respect historic design standards. Such changes should note the material, design motifs and impacts of development on historic features and should emphasize the importance of highlighting the disparities and the displacement of African American communities in the County. Please see Appendix 1 for detailed staff comments on how the Plan should refine this section to incorporate the full picture of this period.

Multimodal Transportation Improvements: Arlington County staff are supportive of the Plan's proposed multimodal travel improvements between the Pentagon and the surrounding streets and trails. TPCPM staff have been coordinating with the Pentagon on multiple transportation projects adjacent to the Pentagon Reservation property. Please see Appendix 1 for technical staff comments on transportation and circulation impacts within the Pentagon Reservation boundaries.

Thank you for the opportunity to review the draft Pentagon Reservation Master Plan Update. Arlington County looks forward to a continued cooperative relationship with the Pentagon and NCPC.

Sincerely,



Anthony Fusarelli, Jr., AICP
Planning Director

CC: Claude Williamson, Director, Department of Community Planning, Housing and Development (CPHD)
Shannon Flanagan-Watson, Deputy County Manager, County Manager's Office, (CMO)
Jennifer Smith, Comprehensive Planning Manager, CPHD
Kellie Brown, Comprehensive Planning Section Supervisor, CPHD

Appendix 1: Additional Comments Matrix of Arlington County

Department of Community Planning, Housing and Development – Planning Division		
Page	Text	Comment
Volume 1: Page 2-10	The Pentagon Master Plan also increases green space on the Pentagon site by 7.5 percent. Refer to Section 3.7 (Environment and Sustainability Projects) in the Pentagon Master Plan for additional information.	Staff also encourages studying the potential to establish a tree canopy target for the campus responsive to the Pentagon’s Environmental Protection and Sustainability goals, noting the Pentagon City’s Sector Plan’s target of at least 20 percent tree canopy on the site and its surrounding streetscape environments as a point of reference.
Volume 2: Appendix A	N/A	This version of the Pentagon Reservation Master Plan Update (August 2023) had several errors related to referencing table and figure numbers (see examples in pages 2-45, 2-47, 2-52), as well as redactions that were not part of the earlier version received from NCPC, dated July 5, 2023 (see examples in pages 2-51, 3-25). Furthermore, some of the tables in this version had the last item missing consistently in each table so not sure if this was an error due to redesigning the table layout (see examples in page ES-5 (Tables ES-2- ES-5), page 2-3, and page 3-24 (Table 3-1 total is missing in this August 2013 version in comparison to the July version received by NCPC for review).
Appendix A: 2-49	100 percent carbon-pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon-pollution-free electricity	Is this goal achievable in six (6) years?
Appendix A: 3-8	Mixed-Use/Support: This category has been created to reflect a land use pattern that may contain a mixture of uses, including private development and Support as the primary functions. These areas could also include green space and public transportation uses integrated into a development.	As this section elaborates on an additional study recommended to determine the most appropriate mix of uses based upon constructability, it is important to note that the Pentagon City Sector Plan identifies “new public access corridors needed to transform the area’s large parcels into a high-value, mixed-use, multi-modal district” and creating linkages between these corridors and mixed-uses leading to the Pentagon.

Department of Parks and Recreation (DPR)		
Page	Text	Comment
Appendix A: General Comment	Tree Canopy and Green Infrastructure	Consider using Arlington County’s recommended tree lists when selecting trees for the site:

		https://www.arlingtonva.us/Government/Programs/Sustainability-and-Environment/Trees/Plant-Trees/Recommended-Trees Consider alternatives to the “Tree filter” bioretention, such as larger bioretention facilities, as the County has seen poor performance of trees in those facilities. Consider using small/medium shrubs instead of trees, where space is limited.
Appendix A: General Comment	Public Spaces	The plan uses an outdated rendering image for Long Bridge Aquatics Center. DPR can provide a correct image, if requested. Please contact Ryan Delaney for any questions/inquiries at rdelaney@arlingtonva.us
Appendix A: General Comment	Bicycle/Pedestrian/Trail Connectivity	Please include a reference to the Green Ribbon connection at South Eads Street detailed in Section 3.6.1 - Pentagon South Pedestrian Safety Project and South East Parking Project of the Pentagon City Sector Plan (page 115).

Department of Environmental Services (DES) - Transportation Division		
Page	Text	Comment
General	N/A	Please continue planned coordination with the Arlington County Department of Environmental Services, Transportation Division, and/or VDOT, on short-term and long-term projects identified in the master plan update and draft EA that make changes to the transportation network and associated land use, including: <ul style="list-style-type: none"> - Army-Navy Drive Offsite Parking Lots Feasibility Study (long-term) - Pentagon South Pedestrian Safety Project (short-term) - North Parking Lot Improvements Project (short-term) - Southeast Parking Project (short-term) - Connector Road and Boundary Channel Drive Intersection Improvements Project (short-term) - Connector Road Bridge Upgrades (short-term)
Page 3-31	In addition to two high occupancy vehicle (HOV) lanes and several feeder lanes between ramps, I 395 contains four to five lanes in either direction.	The I-395 lanes are High Occupancy Toll (HOT) lanes in this location.

Page 3-32	Richmond Highway (SR 110) is a 2.41-mile freeway stretching from Crystal City to Rosslyn.	Suggested Edit: replace freeway with Limited-Access Route as described in Arlington’s Master Transportation Plan Map. Suggested Edit: <i>connects U. S. Route 1 in Crystal City to I-66 in Rosslyn. Many people associate Richmond Highway as U. S. Route 1 in Crystal City.</i>
Page 3-32	Richmond Highway was formerly named Jefferson Davis Highway until October 2019.	Recommended Edit: Richmond Highway, formerly Jefferson Davis Highway, was renamed by Arlington County in October 2019.
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		<p>American communities like Johnson’s Hill (now referred to as a Arlington View), and what the community accomplished to rebound from these setbacks, such as the creation of the Arlington County’s Neighborhood Conservation Program (now named the Arlington Neighborhoods Program).</p> <p>3. Staff suggests utilizing Arlington County’s A Guide to the African American Heritage of Arlington County (reference pages 3, 45-47, 49 and 53) and emphasizes the importance of transparency and how these residents were compelled to accept the government’s offer of temporary accommodations, as no other housing options being available.</p> <p>4. Providing an understanding of what these communities included would be beneficial. For instance, constructed in 1930, the Mount Zion Baptist Church was demolished, and the federal government dumped refuse from the construction of the Pentagon in the ravines of Johnson’s Hill, a nearby African American community. Staff encourages refinement of this section of the plan to incorporate the full picture of this history.</p> <p>Please contact Lorin Farris for any questions/inquiries at lfarris@arlingtonva.us.</p>
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Commission Action

October 5, 2023

PROJECT Pentagon Reservation Master Plan Update 1155 Defense Pentagon Arlington, Virginia	NCPC FILE NUMBER MP174
SUBMITTED BY United States Department of Defense, Washington Headquarters Services	NCPC MAP FILE NUMBER 1.62(05.00)45698
REVIEW AUTHORITY Approval of Master Plans for use by the Commission per 40 U.S.C. § 8722(a) and (b)(1)	APPLICANT'S REQUEST Approval of comments on draft master plan
	ACTION TAKEN Approved comments on draft master plan

The Commission:

Supports the goals and overall approach presented in the Draft Master Plan Update for the Pentagon Reservation to improve security; enhance safety and quality of life for employees and visitors; enhance environmental sustainability and climate resilience; balance planning factors and development pressures; and enhance multimodal access.

Notes the update serves as a minor revision continuing the vision and goals of the 2016 plan in preparation for a comprehensive master planning effort in five years.

Provides the following comments on the Draft Master Plan Update and recommendations for the next master plan.

Security

Requests that as security projects are developed, they are submitted to NCPC for further review to ensure the proposals balance security needs with considerations of accessibility, design quality, historic preservation, and pedestrian experience.

New Facility and Land Use Changes

Supports Washington Headquarters Services (WHS) for proposed land use changes to reduce the impervious area at the Pentagon and reduce the amount of land dedicated to vehicular parking.

Circulation

Supports WHS for recent and proposed parking area improvements to the Pentagon Campus including, the reduction of parking to meet the Comprehensive Plan standard 1:4 employee parking ratio and the proposed pedestrian safety improvements to parking areas throughout the campus.

Notes the applicant will provide an updated Transportation Management Plan (TMP) within one year of NCPC final approval of the Master Plan Update. The TMP should be consistent with the policies outlined in the Transportation Element of the Comprehensive Plan, and specifically the parking ratio standards of 1:4 for the Pentagon and 1:2 for the Mark Center.

Environmental Sustainability and Energy

Supports the proposed increase in green space and bioretention on the Pentagon Campus and the proposed projects to reduce energy consumption and greenhouse gas emissions.

Coordination


Recommends that WHS coordinate with the Arlington County Department of Community Planning, Housing & Development (CPHD) Neighborhood Services Division to refine the Historic and Cultural Resources section of the plan to incorporate further information and/or resources about the history of the use of eminent domain to seize Black communities for the construction of the Pentagon.

Recommends that WHS coordinate pedestrian improvements between the Pentagon 9/11 Memorial and proposed Visitor Education Center with Arlington National Cemetery, the Pentagon Memorial Fund, and applicable local and federal transportation agencies.

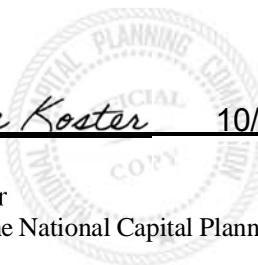
Future Planning

Notes that the incorporation of additional trees on the interior of the campus is subject to security considerations; therefore, **recommends** that prior to the next Pentagon Reservation Master Plan, the applicant study the potential to further expand tree canopy and consider setting a tree canopy target in the next Master Plan.

Consider the following opportunities: to go beyond historic documentation and include interpretive signage or other types of permanent memorialization in consultation with descendants of the East Arlington and Queen City communities; to provide enhanced, sustainable green spaces; and in future planning on any excess land, look for affordable housing and mixed use development partnership opportunities.

 10/05/2023

Julia A. Koster
Secretary to the National Capital Planning Commission



-----Original Message-----

From: NCPC System <info@ncpc.gov>
Sent: Wednesday, October 4, 2023 11:37 AM
To: NCPC General Information <info@ncpc.gov>
Subject: NCPC Website Email

From: Ben D'Avanzo

Thank you for the opportunity to comment on the Pentagon Reservation Master Plan. I live in Pentagon City, and while these comments are my own, I represented the neighborhood on the Pentagon City Sector Plan Working Group and am a member of the Crystal and Pentagon Cities Council. I would encourage two ways to improve this plan.

First, I am pleased to see the proposal to identify alternate land uses for the parking lots south of 395. With development anticipated at the Amazon and Brookfield properties across Army Navy Drive, which itself is being improved, there is a good opportunity for this land to reflect uses more appropriate for the urban and transit-oriented nature of the area. In particular, I strongly encourage the final plan to directly consider the opportunity to use these sites to provide some recognition for the Black families that were displaced from Queen City nearly 100 years ago. In particular, the plan should prioritize studying the donation of these parking lots for the purposes of building affordable housing. With rising housing prices leading to increased displacement in our area, including challenges for Pentagon employees, housing would be both a symbolic and beneficial use of this land instead of parking.

I also recommend a more pedestrian-centered pathway connecting Pentagon City to the Pentagon and the 9/11 memorial. Many people travel by foot between these areas, ranging from Pentagon employees patronizing local businesses to tourists staying in Pentagon and Crystal Cities visiting the memorial. While the plan anticipates some pedestrian and bike improvements between 395 and the Pentagon, they appear to be on the smaller side and still involve many road crossings. I instead encourage the plan to take inspiration from the "Green Ribbon" component of the Pentagon City Sector plan, which has a biophilic pedestrian-oriented pathways winding through the city. The Master Plan should extend the Green Ribbon through the tunnel under 395 and across the Reservation to the 9/11 memorial, resulting in a safe, healthy and enjoyable connection between these areas.

I have attached relevant pages from the Pentagon City Sector Plan, including diagrams envisioning the potential for activated street frontage properties along Army Navy and information on the Green Ribbon.

You may find the full plan here:

<https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.arlingtonva.us%2Ffiles%2Fshar edassets%2Fpublic%2Fv%2F1%2Fprojects%2Fdocuments%2Fpentagon-city-planning-study%2Fpentagoncitysectorplan%2Ffinal%2Ffor%2Fprint.pdf&data=05%7C01%7Cinfo%40ncpc.gov%7Cb02dcce149b54008dd6b08dbc4efd567%7Cedff5ddd1a0641e19f8c3ef5763b3577%7C0%7C0%7C638320306686398045%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTil6lk1haWwILCJXVCi6Mn0%3D%7C3000%7C%7C%7C&sdata=BpCAJfp6xUpAisTtoK3ew6KMeDitoxZTFx62t9sMrPo%3D&reserved=0>

Thank you for your consideration,

-Ben

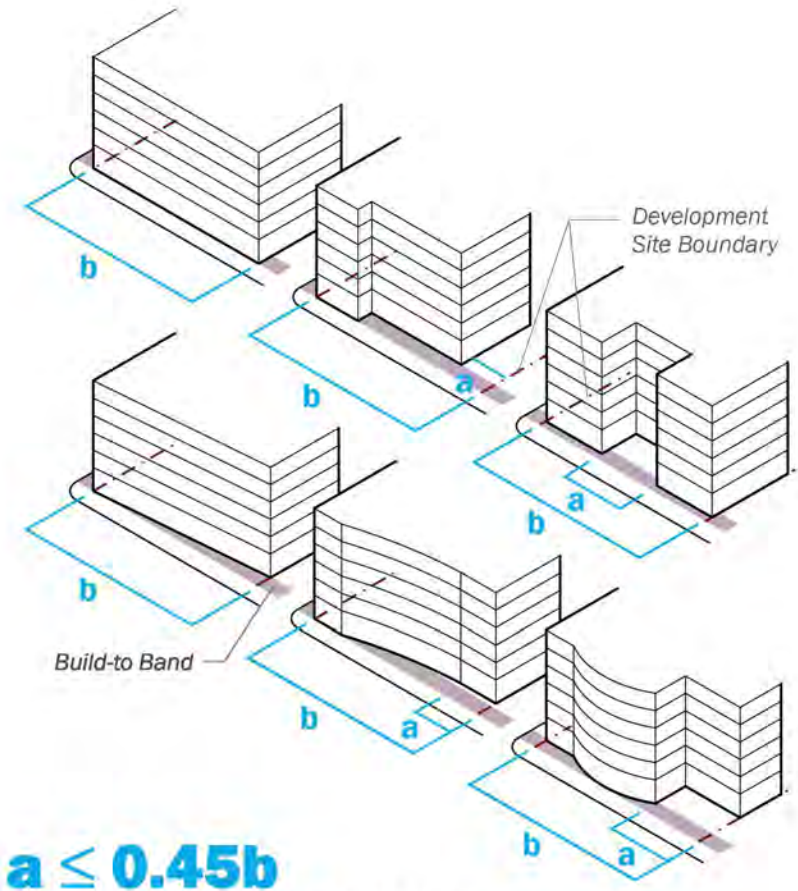
4.3 Building/Public Realm Edge

Policy Approach

- Locate building façades to form a consistent edge along public streets, walks, and plazas, shaping these as outdoor rooms. Building façades should be present within an approximate “**build-to band**” within 8 feet of the public sidewalk passage along approximately **55%** or more of the length of each parcel edge along a street. One or more buildings may help form this continuous edge.
- A larger **build-to band of 12 feet** may be permitted when used to provide public space, pedestrian access, biophilic features, or other amenities such as outdoor dining or public art that help shape and improve public streets, walks, and plazas.
- No specific setbacks are recommended except in desired areas per the Sector Plan to accommodate a public easement, or to transition height toward adjoining R2-7 and R-10 zoning districts.
- Build-to-band is intended to regulate the base section of future buildings (generally first 1-5 stories), recognizing other architectural treatments, step-backs, and facade articulation will occur above, which could place upper sections of the buildings outside of this band.

Intended benefit responding to Guiding Principles

- Enhance pedestrian experience
- Create a more continuous network of pedestrian-friendly streets and walks
- Shape streets and public spaces that have distinctive sense of place and, in turn, contribute to identity of Pentagon City and the broader 22202 area



a = frontage without building edge
b = overall site frontage

- Multiple options for placing façade **within 8' build-to-band**
- Occupy at least **55% of site frontage per block**
- Accessible public space is excluded from overall site frontage

BUILDING / PUBLIC REALM EDGE

Building / Public Realm Edge

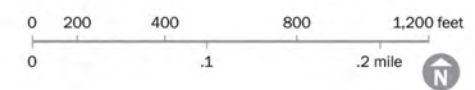
Existing RiverHouse tree canopy should be preserved (generally 60 feet from western lot line and generally 40 feet from southern lot line)

- Fixed Build-to-Zone
- - - Variable Build-to-Zone (alignment may vary between endpoints)
- Destination Public Places — Minimum area as noted. Ultimate configuration/site location to be determined during 4.1 siteplan or sitewise PDSP review.
- Alignment
- ↔ Line of Sight Unobstructed by Buildings
- Green Ribbon Flexible Placement**
- Primary Route (widest pedestrian zone)
- Secondary Route (widest planting zone)
- Potential Extensions
- - - Study Area Boundary
- M Metro Station



VEHICULAR ACCESS TO BE MAINTAINED ON 15TH STREET

RIVERHOUSE



4.5 Retail and Active Edges

Policy Approach

- Design and occupy designated ground level building spaces along sidewalks in order to support a pedestrian-friendly urban environment and successful variety of pedestrian-oriented retail and service uses and retail equivalents. The diagram on the facing page identifies four types of locations with differing requirements, per the color categories in the Arlington County Retail Plan:
 - **RED** Highest priority locations for active retail, usually clustered in nodes or corridors. Exterior and interior design recommendations apply. Limited range of non-retail uses acceptable.
 - **GOLD** Secondary priority locations for retail or other active uses. Exterior and interior design standards apply. Broader range of non-retail uses acceptable. Retail equivalents are uses that, like retail, draw the public and customers to provide an active street life. Retail equivalents can include: child care centers, conference facilities, schools and other educational facilities,

maker spaces, medical uses, civic and government uses. For other uses, a retail equivalent might be part of the primary use that has more public components, such a lobby for a hotel; work cafes, enhanced lobbies, or conferencing space for offices; or resident amenity areas, fitness centers, and leasing spaces for residential uses.

- **BLUE** Secondary priority locations for retail or other active uses. Exterior (not interior) design standards apply. Broader range of non-retail uses acceptable.
- **GREEN** No retail design or occupation requirement, but frontage may be subject to other Sector Plan design guidelines such as for ground level residential and office use.



Intended benefit responding to Guiding Principles

- Enhance the pedestrian experience
- Make a broad range of commercial and community services available to support principal land uses
- Provide appropriate space opportunities for businesses
- Provide Pentagon City the resiliency to accommodate a changing range of retail and service needs and opportunities over time.

FUTURE RETAIL

CHANGE FROM PAST POLICY

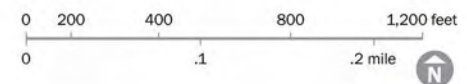
Focus on corners for retail and retail equivalent uses, with mid-block ground-floor frontages subject to non-retail design requirements

Anticipate that redevelopment of shopping center properties may concentrate and change retail mix, requiring greater flexibility

Focus retail frontage in highly-visible, high-pedestrian volume locations, including at 12th Street S and S Hayes Street and along larger public spaces of the Green Ribbon

RED*	GOLD*	BLUE*	GREEN
Design standards; exterior & interior	Design standards; exterior & interior	Design standards; exterior	No design standards**
Retail sales	Retail sales	Retail sales	All uses as permitted by the Zoning Ordinance
Food establishments	Food establishments	Food establishments	
Entertainment establishments	Entertainment establishments	Entertainment establishments	
Services	Services	Services	
Repairs	Repairs	Repairs	
	Retail equivalents	Retail equivalents	

* Other uses as permitted in the Zoning Ordinance may be approved, on a case-by-case basis, by the County Board. | ** Other adopted design standards may apply.



21ST ST S



3.4 The Green Ribbon

This new signature public space element for Pentagon City responds to the strong community desire for safe, pleasant, and biophilic ways to walk throughout the broader 22202 area. The Green Ribbon will represent a dynamic and connective urban thread that will increase the amount of quality public space available in the study area. Additionally, the Green Ribbon will:

- Add areas for **planting**, enhancing **biophilic qualities** and low-impact **stormwater management**.
- Extend and enhance Pentagon City’s multi-modal network to be consistently **safe and inviting** for pedestrians and for other modes as appropriate to location. New access ways that fill gaps, and additional intersections that expand choice of route, would significantly improve access.

Policy Approach

- Create a connected network of generous, biophilic walking paths that achieve multiple goals:
 - A recreational path network connecting all people in and around Pentagon City with park facilities and other destinations in 22202 and beyond
 - New casual use spaces along the network, in various settings ranging from parks to active retail frontage
 - Increasing tree canopy and permeable, planted ground surface
 - Filling gaps in the study area’s pedestrian network where conventional streets would be difficult or inappropriate, with special attention to crossings
 - Unique sense of place, identity, and community through distinctive design and enthusiastic community use



The precedent images on the following pages illustrate examples of components designed to achieve the multiple goals of the Green Ribbon. These examples are meant to be inspirational, and should not constrain future design responses that achieve the goal of a biophilic experience.



The design of the Green Ribbon will vary by site and context, including whether the segment is part of a redevelopment project, pursued by the County on public property or right-of-way, or established on an existing site or access way in advance of redevelopment to enable greater connectivity. This example shows how the Green Ribbon could be integrated into development with interspersed frontage zone (including building access and outdoor spaces) and continuous, layered planting areas on both sides of the pedestrian path.



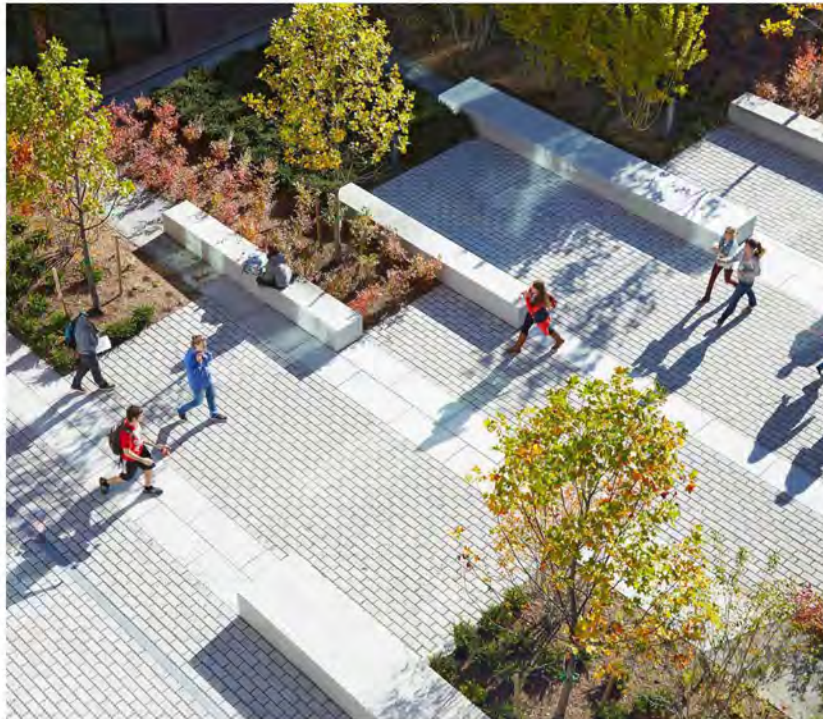
Frontage Planting Pedestrian Path Planting Frontage

The section above shows a conceptual section of the Green Ribbon, including the pedestrian path and planting areas that make up the Green Ribbon, as well as adjacent frontage zones. These are not strict divisions—in most places, planting zones may intersperse within frontage area, or even into the pedestrian path. The frontage zone will vary by context; it may include further plantings, access to retail and services, outdoor dining, entrances or amenity spaces to residents, or other uses that help achieve an indoor-outdoor transition in redevelopment and help create a safe walking path. In some cases, the Green Ribbon may be located along right-of-way where there is a frontage zone on only one side. The design of the Green Ribbon through a site, and how redevelopment responds to it, should be an important topic for SPRC review.

public space

Green Ribbon Design Guidelines

- Additional Design Guidelines for the Green Ribbon are attached in the Appendix, incorporating different design strategies appropriate for the varied contexts and sites the Green Ribbon will pass through in order to create a continuous, cohesive network.
- The **clear pedestrian path** should have a width of 8 to 12 feet, although wider areas may be possible or needed where the Green Ribbon comes to a plaza, Metro entrance, or other high-volume pedestrian space. Narrower widths may be possible on limited segments. On private property, the pedestrian path should incorporate biophilic features such as permeable pavers, natural analogues, or others that respond to the development context. On public right-of-way, the path must comply with County standards.



- **Planting areas** should be generous and layered to fulfill biophilic principles. The approach to planting should take into account seasonal variation, native species, and environmental benefits such as stormwater as appropriate to a site.
- Tree canopy is prioritized wherever feasible. The Green Ribbon will contribute to achieving over 20% tree canopy throughout Pentagon City.
- Planting can be provided in many formats, whether in-ground or in planters. Planters may integrate seating or delineate outdoor dining areas.
- Lighting, wayfinding, and amenities like drinking fountains help support safe, easy to navigate travel along the Green Ribbon.



- Initial development proposals should coordinate closely with the National Landing BID to ensure wayfinding signs are consistent and help link unique segments the Green Ribbon network. Once established, subsequent proposals should match earlier designs.
- The Green Ribbon should include periodic public seating, either at the edge of the pedestrian path or within the planting zone. Seating and other furnishings should be designed as part of biophilic design approaches.
- Throughout the Green Ribbon, other elements and amenities, such as public art and interpretive signage can help enrich the biophilic experience and provide additional opportunities for cultural interpretation.
- Where topography creates views, the Green Ribbon design should provide moments to enjoy them. In most locations, the Green Ribbon should be universally accessible. In limited locations, including navigating the rise to Arlington Ridge, stairs may be incorporated as part of Green Ribbon segments.
- When providing tree canopy is not feasible, **other appropriate vertical features** could include shade structures, living walls, water features, murals, or architectural fences (or screens) with biophilic features.



public space

3.4 The Green Ribbon (continued)

Green Ribbon Routing

- The diagram on the facing page identifies **priority Green Ribbon routes**, as well as potential locations for future extension throughout Pentagon City and connecting to surrounding areas. The routes utilize a mix of private land and existing public access ways and parks. Actual route alignment is flexible as long as key intersection points or destinations are linked.
- The Green Ribbon will be expected to be accommodated on sites undergoing redevelopment through the site plan process. On public property, the County can lead development of the Green Ribbon. Where there are opportunities to extend the Green Ribbon on private property not undergoing redevelopment, the County can coordinate with interested property owners to achieve desired connections.
- The Green Ribbon links together other public spaces that can contain other elements and amenities which may not typically be found within the Green Ribbon design guidelines. In these locations, easy access to and from the Green Ribbon will help link the public space network in Pentagon City, a goal of Arlington County's [Public Space Master Plan](#) as well as [Livability 22202](#) planning.
- At a **typical width of at least 16 feet along the Green Ribbon**, the more than three miles of new walks shown in the diagram would represent more than four acres of net new public space in Pentagon City. This is exclusive of the parks, plazas, and existing sidewalk areas the Green Ribbon passes through.

At full build-out of the highest priority routes, **the Green Ribbon would create approximately three miles** of new and improved pedestrian walks providing over **four acres of new public space** along the Green Ribbon, exclusive of other park and plaza spaces it connects together.

- Throughout Pentagon City, the Green Ribbon, while accommodating slower-moving cyclists, can be designed to **discourage higher-speed bicycle travel**. Therefore, concurrent improvements to on-street bicycle facilities are essential.
- The Green Ribbon includes a segment—along the incline from Grace Hopper Park to Lynn Street—which can safely accommodate different modes of travel given the grade of the path.

3.5 Green Connections: 22202 and Beyond

This section responds to connectivity goals expressed through the Livability 22202 initiative and Biophilic Arlington, and leverages county-scale trail loop opportunities identified in the Public Spaces Master Plan. It will extend the benefits of the Green Ribbon and create a more cohesive, connected district beyond Pentagon City.

Policy Approach

- Extend Pentagon City’s pedestrian, bike and trail network - including Green Ribbons, sidewalks, and bike facilities - beyond the study area to make valuable connections between Pentagon City and the greater 22202 zip code, Columbia Pike, Reagan National Airport, other existing and planned expansions of these networks throughout the County and the region. Within the study area, locate these corridors to facilitate internal and external continuity.
- Implement physical and aesthetic improvements at highway crossings and other formidable barriers to achieve safe, comfortable routes to the Columbia Pike corridor, Inner Loop, Pentagon Lagoon, Long Bridge Park, Crystal City, and Mount Vernon Trail. Connections south and west through Arlington Ridge and Aurora Highlands will also require special attention to be compatible with neighborhood streets.
- Design trail connections to be consistent with the Arlington Public Spaces Master Plan.

An **extension of the Green Ribbon to Long Bridge Park** would greatly improve 22202 access to Arlington’s fourth largest park, and could **become a gateway** to the Mount Vernon Trail

